

RADIO **AMATEUR**

AUGUST 1994
Volume 62 No 8



Journal of the Wireless Institute of Australia



IN THIS ISSUE:

Beam Antennas with Bent Elements
Review of ICOM IC-281H and Kenwood TM-251A
The Chinese Connection

and lots more

KENWOOD



TRAVEL LIGHT

All-Mode Communications on the Move

Road warriors looking for the ultimate in mobile communications are sure to love Kenwood's new TM-255A (144MHz). This compact all-mode transceiver features a detachable front panel — a world first in this class — for easy mounting in any vehicle. But, mobile or stationary, it delivers matchless performance in FM, SS8 and CW modes. Standard features include 101 memory channels, built-in DTSS with pager, DDS with "fuzzy" control, S-meter squelch, and a 1200/9600 baud packet terminal. Truly a powerful package. But surprisingly easy to operate, thanks to the remote-control microphone with programmable keys, dual-menu system, and twin tuning dials. All-mode versatility at its best. And Kenwood made it happen.

■ 101 memory channels ■ Max. 40W output ■ DDS with fuzzy logic control ■ Twin tuning dials
 ■ Dual-menu system ■ Built-in DTSS with pager ■ AIP (Advanced Intercept Point) ■ IF-SHIFT
 ■ Pulse noise blanker ■ Semi break-in ■ TF-SET ■ Tone alert system with elapsed time indicator
 ■ S-meter squelch ■ All-mode squelch ■ Built-in CTCSS encoder ■ 1200/9600 baud packet terminal. ■ Multi-function microphone

ALL-MODE TRANSCEIVER **TM-255A**

KENWOOD ELECTRONICS AUSTRALIA PTY. LTD.
 (INCORPORATED IN N.S.W.)

8 Figtree Drive, Australia Centre, Homebush, N.S.W. 2140
 Phone (02) 746 1519, (02) 746 1888, Fax (02) 746 1509
 Interstate Toll Free 1800-656-352

Call now for further information and the name of your nearest authorised Kenwood dealer.

Kenwood Electronics Australia Pty Ltd only warrants products purchased from their authorised Australia dealers.



Amateur Radio is published by the Wireless Institute of Australia, ACN 004 920 745 as its Official Journal, on the last Friday of each month.

PUBLICATIONS COMMITTEE

Editor

Bill Rice VK3ABP

Production Editor

Bill Roper VK3BR

Senior Technical Editor

Peter Gibson VK3AZL

Technical Editors

Evan Jarman VK3ANI

Gil Sones VK3AUI

Bob Tait VK3UI

Marketing

Norm Eyles VK3ZEP

Bruce Kendall VK3WL

Contributing Editor

Ron Fisher VK3OM

ASSOCIATE EDITORS

Technical

David Brownsey VK4AFA

Don Graham VK6HK

Peter O'Connor VK4KIP

Phil Steen VK4APA

Roy Watkins VK6XV

WIA News

Roger Harrison VK2ZRH

PROOF READERS

Allan Doble VK3AMD

Jim Payne VK3AZT

Graham Thornton VK3IY

John Tutton VK3ZC

DRAFTING

Vicki Griffin VK3BNK

ADVERTISING

June Fox

Brenda Edmonds VK3KT

CIRCULATION

Chris Russell VK3ARZ

Sue Allan

All contributions and correspondence concerning the content of *Amateur Radio* should be forwarded to:

Amateur Radio

PO Box 2175

Caulfield Junction VIC 3161

REGISTERED OFFICE

3/105 Hawthorn Road

Caulfield North VIC 3161

Telephone: (03) 528 5962

Fax: (03) 523 8191

Business Hours: 9:30 am to 3 pm weekdays

Deadlines Editorial Hamads

September 08/08/94 10/8/94

October 12/09/94 14/09/94

November 10/10/94 12/10/94

Delivery of AR: If this magazine is not received by the 15th of the month of issue, and you are a financial member of the WIA, please check with the Post Office before contacting the registered office of the WIA. ©

© Wireless Institute of Australia 1994

CONTENTS

Technical

Equipment Review — ICOM IC-281H and Kenwood TM-251A..... 4

Paul McMahon VK3DIP

Beam Antennas With Bent Elements — Part 1..... 8

John Sproule VK2AGT

Random Radiators..... 15

Ron Cook VK3AFW and Ron Fisher VK3OM

Technical Abstracts..... 18

Gil Sones VK3AUI

General

The Chinese Connection..... 13

Joe Ellis VK4AGL

Book Review — DXpeditioning Basics..... 26

Stephen Pail VK2PS

Operating

Awards

Diploma Espana..... 24

Diploma 100 EA CW..... 24

Diploma CIA..... 24

Diploma TPEA..... 24

Diploma EA DX 100..... 24

VK DXCC Listings..... 24

Contests

SARTG RTTY Contest..... 30

Panama Anniversary Contest..... 30

Bulgarian DX CW Contest..... 30

35th Scandinavian Activity Contest..... 30

CQ WW RTTY DX Contest..... 31

Addendum to 1993 VK/ZL/Oceania DX Contest Results..... 31

1994 VK/ZL/Oceania DX Contest Rules..... 31

Columns

Advertisers Index..... 56

ALARA..... 22

AMSAT Australia..... 21

An Old Timer Reflects..... 39

Club Corner..... 32

Divisional Notes..... 33

VK2 Notes..... 33

VK3 Notes..... 33

VK7 Notes..... 34

Editor's Comment..... 3

Education Notes..... 35

Federal QSP..... 2

FTAC Notes..... 34

Hamads..... 54

HF Predictions..... 52

How's DX?..... 36

Intruder Watch..... 32

Morse Practice Transmissions..... 56

Over To You..... 41

Packet World..... 39

Pounding Brass..... 42

QSLs from the WIA Collection..... 45

QSP News..... 21, 51

Repeater Link..... 44

Silent Keys..... 47

Spotlight on SWLing..... 46

Stolen Equipment..... 39

Technical Correspondence..... 47

VHF/UHF — An Expanding World..... 48

What's New..... 50

WIA News..... 7, 14, 16, 25

WIA — Divisional Directory..... 3

WIA — Federal Directory..... 2

Cover

David VK5KK was photographed on 9 February 1994 during a contact with VK5NY on 10368.050 MHz SSB between 1003 and 1035 (twilight). David operated portable on a hill behind his home near Salisbury Heights water tanks. He used a DB6NT transverter with an output of 200 mW SSB to a 600 mm dish. Signals were 5x9 both ways for the non line-of-sight path (beaming through the western side of Mount Lofty which is at least 200 metres higher than VK5KK) of 55 km.

Amateur Radio Service

A radiocommunication service for the purpose of self-training, intercommunication and technical investigation carried out by amateurs, that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

Wireless Institute of Australia

The world's first and oldest National Radio Society Founded 1910

Representing the Australian Amateur Radio Service

Member of the International Amateur Radio Union

Registered Federal office of the WIA:

3/105 Hawthorn Rd, Caulfield North, Vic 3161

All Mail to:

PO Box 2175, Caulfield Junction, Vic 3161

Telephone: (03) 528 5962

Fax: (03) 523 8191

Business Hours: 9.30am to 3.00pm on weekdays

Federal Secretary

Bruce Thorne

Office Manager

Donna Reilly

COUNCIL

President	Neil Penfold	VK6NE
VK1 Federal Councillor	Richard Jenkins	VK1RJ
VK2 Federal Councillor	Roger Harrison	VK2ZRH
VK3 Federal Councillor	Alan Noble	VK3BBM
VK4 Federal Councillor	Ross Marren	VK4AMJ
VK5 Federal Councillor	Bill Wardrop	VK5AWM
VK6 Federal Councillor	Bruce	
	Hedland-Thomas	VK800
VK7 Federal Councillor	Jim Forsyth	VK7FJ

FEDERAL CO-ORDINATORS

AMSAT:	Graham Ratcliff	VK5AGR
Awards:	John Kelleher	VK3DP
Contest Manager:	Peter Nesbit	VK3APN
Education:	Brenda Edmonds	VK3KT
EMC:		
FTAC:	John Martin	VK3KWA
Historian:	John Edmonds	VK3AFU
Honorary Legal Counsel:	George Brzostowski	VK1GB
IARU:	Kevin Olds	VK1OK
Int'l Travel Host Exch:	Ash Nallawalla	VK3CIT
Intruder Watch:	Gordon Loveday	VK4KAL
Media:	Roger Harrison	VK2ZRH
QSL Manager(VK9,VK0):	Neil Penfold	VK6NE
Standards:	Roger Harrison	VK2ZRH
Videotapes:	Bob Godfrey	VK4BOB
ITU Conference and Study Group:	David Wardlaw	VK3ADW
WICEN:	Leigh Baker	VK3TP

Federal QSP

Wonderful Hobby — Amateur Radio

Have you noticed how the number of amateurs on the bands is not increasing? Every issue of *Amateur Radio* brings a few more Silent Keys. It's not just me that's getting "greyer" — we all are! Is there something we could be doing to build up the numbers of amateurs, and to guarantee the survival of this wonderful hobby?

Firstly, I believe we need to recognise the need to sell our hobby. Never before has there been such a wide range of pastimes available for enthusiasts. Never before has the worker had such large amounts of "free time". Never before have people had such long periods of retirement, not always voluntarily. We need to be out there competing with other hobbies for bodies. We need to be demonstrating more overtly what a wonderful hobby amateur radio can be.

I have interests in other hobbies including sailing, computing, riding an older motor cycle, beer-making, and caravanning. Interesting and challenging as these pastimes are, not one of them has the capacity to include such a wide range of interests within the overall scope of the single hobby. Consider packet, QRP operation, contexts, VHF—UHF operation. DX chasing, rag-chewing, awards, community involvement, radio astronomy, etc, etc. The list just goes on and on. There really is something for everyone's taste in amateur radio.

What's my point, you say? Well, I beg you to do something about recruitment this year. Don't put it off. You could get run over by the proverbial bus! Even run down by a taxi, as my wife was last year. Join the active brigade, that small bunch of amateurs who volunteer. Speak up at club meetings, join the team for JOTA or the demonstration station at the mall, consider going along to your local primary school to give a talk, particularly when they organise Science Week, activities afternoons, and so on. Ask your radio club to give a small "bookpack" of amateur radio books to a local school library.

Offer to assist a new amateur to get on air. You WILL be welcomed! You may even enjoy it! You will experience the thrill of those first few contacts all over again. Make a commitment NOW to give it a go! Amateur radio needs YOU just as much as some of us need amateur radio!!

Richard Jenkins VK1RJ

Federal Councillor

VK1 Division

ar

Editor's Comment

Economies of Scale (1)

The title phrase is popular with economists and accountants. In its usual field, of manufacturing, it shows that many costs remain nearly constant even when output is considerably increased, so the production cost per item becomes less. This may be extended to imply that the larger an organisation the more efficiently it should be able to work; hence becoming more prosperous, larger still, and even more efficient!

Whether, in fact, these predictions are realised depends on many other factors, such as the relative size of the

market and the efficiency of other organisations in the same field.

Does this type of reasoning fit our own organisation, the WIA? Obviously we are not manufacturing motor vehicles or mousetraps, but we do produce this magazine and the Call Book, and some of the same arguments still apply. In particular, it involves just as much work by just as many people and costs just as much to prepare our 60 pages for the printer, irrespective of whether the printer then produces 1000, or 10,000 copies, or even 100,000! But as things are we have only about 6,000

members, although some years ago it was more like 8,000.

If we had more members, the cost of *Amateur Radio* to each member would be less. Our membership fees could be lower and we would attract more of Australia's 18,000 amateur licensees, thus improving our ability still more, not only to provide the magazine but also to provide other representative services. Our strength in negotiating would be improved if we represented more than half Australia's licensees instead of only 30 odd percent.

However, increased size does not always bring increased efficiency. Next month, I will look at the effect on radio amateurs of the increasing size of Australian cities.

Bill Rice VK3ABP
Editor
ar

WIA Divisions

The WIA consists of seven autonomous State Divisions. Each member of the WIA is a member of a Division, usually their residential State or Territory, and each Division looks after amateur radio affairs within their State.

Division	Address	Officers		Weekly News Broadcasts		1994 Fees
VK1	ACT Division GPO Box 800 Canberra ACT 2601 Phone (06) 247 7008	President Secretary Treasurer	Rob Apathy Len Jones Don Hume	VK1KRA VK1NLJ VK1DHF	3 570 MHz LSB, 148.950 MHz FM, 438.525 MHz FM each Monday evening (except the fourth Monday) commencing at 8.00 pm. Repeated on Wednesday evening at 8.00 pm on 148.950 MHz FM.	(F) \$70.00 (G) \$88.00 (X) \$42.00
VK2	NSW Division 109 Wigram Street Parramatta NSW (PO Box 1068 Parramatta 2124) Phone (02) 869 2417 Freecall 1800 817 844 Fax (02) 633 1525	President Secretary Treasurer (Office hours Mon-Fri 11.00-14.00 Wed 1900-2100)	Michael Corbin Roger Harrison Terry Ryeland Mon-Fri 11.00-14.00 Wed 1900-2100	VK2PFO VK2ZRH VK2UX	From VK2WI 1.845, 3.595, 7.146*, 10.125, 24.950, 28.320, 52.120, 52.525, 144.150, 147.000, 438.525, 1281.750 (*morning only) with relays to some of 14.160, 18.120, 21.170, 584.750 ATV sound. Many country regions relay on 2 m or 70 cm repeaters. Sunday 1030 and 1930. Highlights included in VK2AWX Newcastle news, Monday 1930 on 3.593 plus 10 m, 70 cm, 23 cm. Voicemail highlights on (02) 724 8739. Some broadcast text is occasionally available on packet.	(F) \$86.75 (G) \$83.40 (X) \$36.75
VK3	Victorian Division 40G Victory Boulevard Aahburton Vic 3147 Phone (03) 885 9261	President Secretary Treasurer (Office hours Tue & Thur 0830-1530)	Jim Linton Barry Wilton Rob Hailey Tue & Thur 0830-1530	VK3PC VK3XV VK3XLZ	1.840MHz AM, 3.615 SSB, 7.085 SSB, 53.900 FM(R) Mt Dandenong, 148.700 FM(R) Mt Dandenong, 148.800 FM(R) Mildura, 148.900 FM(R) Swan Hill, 147.225 FM(R) Mt Baw Baw, 147.250 FM(R) Mt Macedon, 438.075 FM(R) Mt St Leonard 1030 hrs on Sunday.	(F) \$72.00 (G) \$88.00 (X) \$44.00
VK4	Queensland Division GPO Box 638 Brisbane QLD 4001 Phone (07) 284 9075	President Secretary Treasurer	Murray Kelly Lance Bickford Roger Gingham	VK4AOK VK4ZAZ VK4HD	1.825, 3.605, 7.118, 10.135, 14.342, 18.132, 21.175, 24.970, 28.400 MHz. 52.525 regional 2m repeaters and 1298.100 0900 hrs Sunday. Repeated on 3.605 & 147.150 MHz, 1930 Monday	(F) \$72.00 (G) \$88.00 (X) \$44.00
VK5	South Australian Division 34 West Thebarton Road Thebarton SA 5031 (GPO Box 1234 Adelaide SA 5001) Phone (08) 352 3428	President Secretary Treasurer	Garry Herden Maurie Hooper Bill Wardrop	VK5ZK VK5EA VK5AWM	1820 kHz 3.550 MHz, 7.095, 14.175, 28.470, 53.100, 147.000 FM(R) Adelaide, 148.700 FM(R) Mt North, 148.900 FM(R) South East, ATV Ch 34 579.000 Adelaide, ATV 444.250 Mt North Barossa Valley 148.825, 438.425 (NT) 3.555, 7085, 10125, 148.700, 0900 hrs Sunday	(F) \$70.00 (G) \$88.00 (X) \$42.00
VK6	West Australian Division PO Box 10 West Perth WA 6872 Phone (09) 434 3283	President Secretary Treasurer	Cliff Bastin Ray Spargo Bruce Hedland-Thomson	VK6LZ VK6RR VK6OO	146.700 FM(R) Perth, at 0930 hrs Sunday, relayed on 1.825 3.560, 7.075, 14.115, 14.175, 21.185, 28.345, 50.150, 438.525 MHz. Country relays 3.582, 147.350(R) Busselton 148.900(R) Mt William (Bunbury) 147.225(R), 147.250(R) Mt Saddleback 148.725(R) Albany 148.825(R) Mt Barker broadcast repeated on 148.700 at 1900 hrs.	(F) \$80.75 (G) \$48.60 (X) \$37.75
VK7	Tasmanian Division 148 Derwent Avenue Lindisferme TAS 7015 Phone (002) 43 8435	President Secretary Treasurer	Andrew Dixon Ted Beard Peter King	VK7GL VK7EB VK7ZPK	148.700 MHz FM (VK7RHT) at 0930 hrs Sunday relayed on 147.000 (VK7RAA), 146.750 (VK7RNV), 3.570, 7.090, 14.130, 52.100, 144.150 (Hobart) Repeated Tues 3.590 at 1930 hrs	(F) \$69.00 (G) \$55.65 (X) \$40.00
VK8	(Northern Territory is part of the VK5 Division and relays broadcasts from VK5 as shown received on 14 or 29 MHz).			Membership Grades		Three-year membership available to (F) (G) (X) grades at fee x 3
				Full (F)	Pension (G)	

Note: All times are local. All frequencies MHz.

Membership Grades
Full (F) Pension (G)
Needy (G) Student (S)
Non receipt of AR (X)

Three-year membership available to (F) (G) (X) grades at fee x 3 times.

Equipment Review

A Case of Parallel Evolution — the ICOM IC-281H and KENWOOD TM-251A

Reviewed by Paul McMahon VK3DIP*

What are they?

These are two very similar transceivers, both intended primarily for use as 2 metre FM mobile units, but with extra features that would make them ideal for the shack. The review sets had serial numbers of 00000024 for the TM-251 and 01705 for the IC-281.

First Impressions

The release of new radios, and the search for new features, continues apace with the release of these devices from their respective makers. When handed these two radios to review, the first thing to strike me (after the "Oh no, not more reviews" thought) was that they both seemed to have a similar claim to fame. That is, they were the first VHF mobiles I had heard of with specific built-in packet capability (including 9600 baud). Closer inspection showed that this was not all that was similar, as will

become more obvious throughout this review. So, rather than bore people with two very nearly identical reviews, I decided to combine the two into one.

What I call the basic features and statistics of these two boxes are summarised in Table 1. As you can see, both sets are very nearly the same size and weight and, even though the Kenwood has a slightly larger display, the basic layout and feel is similar. Both are physically small with large rear heat sinks, both have top mounted speakers, both use similar looking microphone connectors, and both have about the same number of buttons and knobs to do the same things. Other vital statistics are also similar with only relatively minor differences which tend to balance out. Both rigs basically transceive on two metres and additionally receive on 70 centimetres. Both have a high output

power of 50 watts, with a large range of frequency steps available. In fact, probably the biggest difference here would be the fact that the TM-251 came in cardboard "egg carton like" formed packaging, while the IC-281 came in the more traditional foam.

Some comment on the controls and layout is necessary. The IC-281 used a concentric type volume/squelch knob setup which I felt would be a little fiddly to use when mobile. The TM-251 setup of two separate knobs for these functions is probably a better option. Having said this, however, as the top mounted speakers and packet radio connectors attest, many of both of these units will never leave the shack and, as such, the question of concentric or not is probably academic. A similar argument could be made for the displays. The extra information on the TM-251 display is probably wasted when mobile, yet could be useful in the bench mounted situation.

Technical Bits

The next area of interest is what I have called the normal extras. These are shown in Table 2. These things are the features, etc that amateurs have come to expect as being supplied with this sort of rig. Things like memories, scanning, a microphone, etc. Again, in this area, there is little real difference between the models on review. The IC-281 comes standard with more memories, 60 odd versus 40 odd, but the TM-251 can, if necessary, be expanded to have 200. In both cases memories can be allocated to either the main 2 m band or the 70 cm receive band as required. The scanning features are pretty much the same, offering the normal band or VCO scans, as well as memory scans. There is some difference in the supplied microphones with the IC-281 coming with a keypad or touchtone version, while the TM-251 supplies a more basic unit as standard.

Both models provide sophisticated forms of code squelch and pager operation which are, as far as I can tell, proprietary systems. Great, if you need them and have bought the extra modules. However, again I would have preferred some form of standard (across brands) approach.

FEATURE	KENWOOD TM-251	ICOM IC-281
Bands	2m RX/TX 70 cm RX	2m RX/TX 70 cm RX
Freq. Step (KHz)	5, 10, 12, 5, 15, 20, 25	5, 10, 12, 5, 15, 20, 25, 30, 50
TX out (Watts)		(IC-281H)
High	50	50
Medium	10	10
Low	5	5
Rec. Type	Dual Superhet.	Dual Superhet.
1st IF (MHz)	45.05	30.85
2nd IF (KHz)	455	455
Sensitivity (uV) @ 12 dB SINAD	<0.16	<0.16 (2 m) <0.2 (70 cm)
Selectivity (KHz) @ -60dB	>12 <28	>15 <30
Spurious (dB)	60	60
Audio Output	> 2 Watts at 3% Distortion	> 2.4 Watts at 10% Distortion
Weight (Kg)	1.0	0.93
Current (Amps)		
TX (Max)	11	10.5
RX (Min)	0.6	0.8
Size (mm)	140x40x160	140x40x171
Packing	Formed "egg carton" cardboard	Std. Foam

Table 1 — The Basics.

FEATURE	KENWOOD TM-251	ICOM IC-281
Memories	41 (200 with option)	60 + 12 scan edge
Scanning	Full Band, Programmed, Memory	Full Band, Programmed, Memory
Priority Channel Watch	Yes (2 types)	Yes (4 Types)
Code Squelch and Pager etc.	Yes (Proprietary, Some Options Required)	Yes (Proprietary, Some Options Required)
Supplied Microphone	STD. Up/Down + 4 others	Touch Tone Keypad etc.
Supplied Accessories	Mic. Manual Mobile Mounting Bracket Power Cable Misc. Screws (Plus spanner) Spare Fuses.	Mic. Manual Mobile Mounting Bracket Power Cable Misc. Screws. Spare Fuses.
Manual	123 Pages + CCT + Block	56 Pages + Block

Table 2 — Normal Extras.

There is one area here where I want to say well done to both models, and that is in providing something other than just a users manual. In the IC-281 case a reasonably detailed block diagram is provided and, in the case of the TM-251, a block and a circuit diagram are provided. This is the first case I have seen in quite a while that such have been provided as standard and I applaud it. The presence of this information gives me quite a bit more information on how the sets work. For example, it is interesting that, while both sets have very similar sensitivity figures, the receiver front end arrangements are quite different (see Figures 1a and 1b).

The TM-251 uses three separate bipolar (2SC4901) transistors, as far as I can tell, as front ends for 2 m, 70 cm, and Other in three separate chains. The IC-281 on the other hand

uses only two chains, a MOSFET (3SK166) for UHF and a bipolar (2SC4405) for VHF. The differences in style would have made some noise figure, and intermod, measurements interesting. However, my shack does not run to that level of test equipment at this time, and no figures for these were given in the included manuals. Examination of the circuits, however, would tend to suggest that the "Other", or extended band on the TM-251, may not provide as good an intermod performance as provided by the IC-281 on these extended frequencies.

Unfortunately, the TM-251 set supplied for review did not have the extended receive coverage enabled, so I was unable to see if this is a problem in practice. Likewise, the circuits suggest that the IC-281 70 cm and up front end might have a little bit more trouble with intermod than

the TM-251 70 cm only front end although, in this case, I could not find any actual evidence of this in practice. Both sets from the front end on are more or less the same, using pretty standard single chip IF chains. The only departure being that direct detector outputs are made available for 9600 baud packet use.

This brings us on to what I have called here the "Extra" extras; those things that you don't find, or at least haven't usually found till now, on mobile transceivers of this class. Table 3 shows these features for both rigs.

Again, there is little difference between the offerings. As has already been mentioned, the TM-251 reviewed did not have the extended frequency capability enabled, and details of so enabling this feature were not provided in the user manual. From experience, however, I would be pretty certain that all that would be required to do this would be, perhaps, the cutting or moving of something like a single link. Given this, the extended coverage claimed is approximately the same, with both sets also offering AM modes for the VHF AIR band. This is actually an interesting thing with these two radios. Nowhere in the IC-281 user manual supplied is there a mention of extended receive coverage, or auto AM. However, this seems to be what it does! The TM-251 manual, on the other hand, mentions both the extended coverage and the AM mode, yet the supplied set did not have it enabled! This is, at least in part, explained by the greater detail of the TM-251 manual (at 123 pages it is over twice as large as that of the IC-281). The TM-251, as well as having the Auto AM mode, also claims to be able to over-ride the auto selection of mode and has a front panel display indicator for this purpose. It should, of course, be noted that neither set will actually transmit outside the 2 metre amateur band.

Perhaps the single most useful of these extras is the explicit provisions made for packet operation. This consists of connections and modes intended just for packet operation. Of the two implementations the TM-251 is probably the most extensive, with

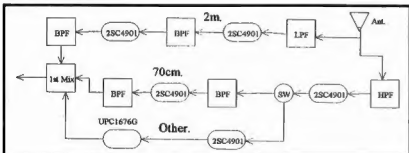


Fig 1a — Partial TM-251 receiver front end.

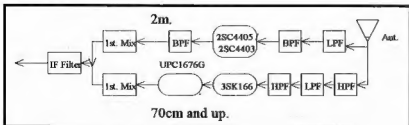


Fig 1b — Partial IC-281 receiver front end.

FEATURE	KENWOOD TM-251	ICOM IC-281
Packet	1200/9600	1200/9600
Extended Freq. Rec.	Not available on review set. (Note 1.)	118-174 MHz 320-999 MHz (Note 2.)
Auto A.M.	Yes (118-136 MHz)	Not Claimed (Note 3.)
Duplex Operation	Yes	Yes
Dimm Screen	Yes	Yes
Lamp Dimmer	Yes (3 steps)	Yes (4 Steps)
Tx Time Out	Yes (Off, 3.5, 10, 20, 30 Mins)	Yes (Off, 3.5, 15, 30 Mins)
Auto Power Off	Yes (Off, 60, 120, 180 Mins)	Yes (Off, 30, 60, 120 Mins)
Front Panel Lock	Yes	Yes

Note 1. Versions available with receive coverage 118 to 174, 300 to 470, and 800 to 1000 MHz.

Note 2. The 320-999 MHz is covered in two bands with a hole in between. Limited time, etc prevented determining the exact edges. The display coverage is continuous.

Note 3. No mention of AM receive capability is made in either the manual or block diagram. However, there have been some reports that this mode is available automatically in the Aircraft band. Available time and equipment prevented further investigation.

Table 3 — "EXTRA" extras

a single six pin connector providing all those lines found on the IC-281 plus a squelch active indication line (see Figure 2).

The IC-281 implementation left the impression of perhaps being a last minute add-on, with some quite confusing aspects. For example, for 1200 baud operation you had to ensure that packet mode was actually turned off! This mode is only used for 9600 baud operation. In the TM-251 case you use packet mode for both 1200 and 9600, with a configuration menu determining if 1200 or 9600 is required. Another example is the IC-281 use of a single 3.5 mm stereo socket for both extension speaker and packet out. It seems from the supplied diagram that, if you used a 3.5 mm mono plug for an extension speaker, you could run the risk of shorting the FM detector output. Anyway, the provision of 9600 baud connections on both the review sets is probably not as useful as it would

be on, say, the TM-451 (the 70 cm equivalent of the TM-251). As far as I am aware most of the 9600 baud activity in Australia is on 70 cm and just being able to receive is of very limited use on packet. It is also interesting, though disappointing, to see that, even though both rigs have adopted the same 8 pin flat microphone socket, they have gone for totally incompatible wiring. This is yet another perfect example of one of the big problems with many of the little things in amateur radio. Amateurs are very good at talking, perhaps in some cases far too good at talking; however, when it comes to actually agreeing on something, well, that is a different matter. At least they got the power connectors the same way around.

Anyway, enough soap box. I also think the transceiver lock or disable is a good feature. I have, on a number of occasions, been none too amused to pick up my car after a service and

find the transceiver on some strange frequency. In both sets reviewed the lock is active despite powering the set on and off. However, there is some indication on the front panel as to which buttons will unlock the set and the determined fiddler would probably figure it out eventually.

The final area to cover in this section is the actual features that one set has but the other does not. As you can see from Table 4 there are not too many of these.

In the TM-251 case the S Meter Squelch ability allows for an alternative to the more usual noise level operated squelch. If enabled this could, for example, allow you to effectively squelch out a fully quieting, but low signal level, station yet still hear a strong station with the same quieting level. The recording feature is also quite novel. Used in conjunction with the code squelch, and or paging, it will actually record the first eight seconds of audio after the last two openings of the squelch (or last one for 16 seconds if so configured), and allow you to play it back at some later time. An option is available in the US that allows the use of this feature as a sort of voice mailbox, which can even be remotely accessed over the air and used to play back the messages, *a la* a telephone answering machine! The Fuzzy tuning is a fancy name for a very simple thing, that can sometimes be useful and sometimes just confusing. The aim is to have the set figure out what tuning step you want based on how fast, etc you are turning the frequency knob. If you are turning fast then it moves to larger steps, slow and it moves to smaller ones. This can be confusing if you haven't read this bit of the manual before you go to move from the bottom to the top of the band. The AM indication and control has already been mentioned.

For the IC-281 the idea of scratch pad memories is an interesting one. The idea here is that the set will remember the last five frequencies, etc that the set operated on, like a five level last number redial. You can step through this stack and save or re-use frequencies as required. The fact that the IC-281 had a voice synthesiser option but the TM-251 did

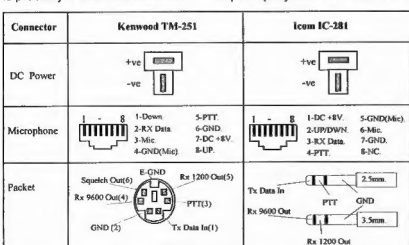


Fig 2 — Plugs and connectors.

KENWOOD TM-251	ICOM IC-281
S Meter Squelch	Scratch Pad Memories (5 levels)
Digital Recording (2x3 Seconds)	Optional Voice Synthesiser.
Fuzzy Tuning	
AM Indication and Control.	

Table 4 — Unique Extras.

not is actually surprising. This is especially so as the previous models from Kenwood did have this option. Perhaps they have decided that this feature is not really required. I must admit to never having actually seen, or heard, of anybody purchasing or using this option.

Operation

Most of my comments about the operation of the two rigs have already been made above, so I will not go through these again.

The basic operation of the two sets was very straight forward. In both cases there has been a move away from masses of buttons and knobs

and towards a series of "menus" to set or configure infrequently used functions. Once you get the hang of this it becomes quite easy to do. The positive side of this is that normal day to day use of the sets is easy. The negative side is that your radio may have some interesting or useful features that you won't know about unless you have a good read of your manual.

In both cases transmit and receive audio quality was good. In the case of the IC-281, for example, when receiving around about the 800 MHz mark it is actually remarkably easy to hear and understand both sides of the conversation.



ICOM IC-281H.



Kenwood TM-251A.

Conclusions

This is a pair of quite similar sets with quite similar features. I would be very happy to own either of them. I am sure that there will be people who will passionately prefer one or the other, but there really just aren't any important differences. Hopefully, there is sufficient information in the above for you to make up your own mind.

The ICOM IC-281H recommended retail price is \$729.24. Thanks to ICOM (Australia) Pty Ltd for the loan of the review transceiver.

The Kenwood TM-251A recommended retail price is \$879.00. Thanks to Kenwood Electronics Australia Pty Ltd for the loan of the review transceiver.

47 Park Avenue, Wattle Glen VIC 3096

ar

WIA News

New WIA Members

The WIA bids a warm welcome to the following new members who were entered into the WIA Membership Register during the month of June 1994.

L30891	MR G DA SILVA
L50323	MR S J CLADINGBOEL
L60335	MR R J BOWEY
L70117	MR M R HARRIS
L70119	MR A C CORDWELL
VK3DBI	MR B GEKAS
VK3FLO	MR A ZATSEPIN
VK3GDK	MR H D KRAUSE
VK3KPU	MR J BAKER
VK3MKI	MR J WALLIS
VK4BCZ	MR G FALCONI
VK4BYR	MISS I L WHYTE
VK4CAB	MR A BEIMERS
VK4CWC	MR W C CARLISLE
VK4FAC	MR E COOK
VK4GCQ	MR J W KENNY
VK4KPH	MR P G HUTCHINGS
VK4SWC	MR S W COOK
VK5KUJ	MR H W KOP
VK5NXB	MR N H TREZISE
VK5OG	MR L E LAWTON
VK5PCI	MR M R STRUGNELL
VK5PMC	MR R A MCINTYRE
VK5ZJG	MR J H HINSCH
VK6BBY	SOUTH WEST AR GROUP
VK7FC	MR F C HARLAND
VK7MGG	MR G W GERKE
VK7XYZ	MR C BOOTH

Beam Antennas With Bent Elements

— Part 1

John Sproule VK2AGT has put many hours into an experimental and theoretical analysis of a popular but little understood antenna.*



The V-5 beam up in the air.

When I obtained a licence several years ago the sunspot cycle was approaching its peak and, having regard to the limited space available for a beam antenna and some other considerations, I settled on a 3-element 15 m Yagi. I soon hankered after 20 m operation and was attracted to the "V-5" tribander

developed by Dick Bird F6IDC/G4ZU and described in Refs 1 and 2.

His claims for its performance were impressive, its mechanical construction looked simple and sturdy, it had about the same turning circle as the 15 m beam it would replace and it could be supported on the same light mast and boom. One

was duly constructed using a commercial trapped dipole and bare wire reflectors for 20 and 15 m, both of truncated V shape. In the 15 m band the antenna matched well and had good directivity. At 20 m an ATU was very necessary with an indication of high input resistance and there was practically no directivity.

Having followed the design closely and having understood that no special adjustment would be necessary, I was at a loss to know what to do. A preface to Ref 1 indicated that the design was based on the technique of "critical coupling" that was said to be due to L A Moxon G6XN. So I turned to his book (Ref 3) for further information. This led to an attempt to measure the ratio of element currents using a loop suspended under them. These tests were not a great success, due to the difficulty of calibrating the loop to give comparative readings of currents in a tube and a wire of very different diameter. However, they showed that, to obtain much current in the reflector, it was necessary to reduce the 20 m reflector length to nearer 10.2 m than the design figure of 10.8 m given in Ref 2.

No similar sets of characteristics have been published for bent beams.

The cut-and-try method without any guiding design theory did not look promising to me and I decided that the only way to understand what was going on was to investigate fully the mutual impedance between the elements. One thing led to another and the investigation extended to computing the main performance characteristics of the V-5 and of other types of bent beam, including 3-element beams.

This two-part article summarises the investigations and how the V-5 was finally adjusted. Part 1 goes straight to results. Part-2 gives enough basic theory to introduce some comments on the results given in the first part, and shows how the self and mutual impedances were computed and the steps taken to obtain an independent check on them.

Performance Of Representative 2-Element Bent Beams

It is generally recognised that the surest method of comparing different designs of antenna is to compute their theoretical "free-space" performance characteristics. For Yagis, such information has been widely published, most notably in recent times in Dr Lawson's book *Yagi Antenna Design* (Ref 4) published by the ARRL. No similar sets of characteristics have been published for bent beams.

The equations that have to be solved to determine element currents for bent beams, and from these gain and front/back ratio, etc, are identical with those for Yagis. The only difference is in the values to be inserted in them for the self impedances of the elements and the mutual impedances between them.

Using impedances determined by the methods that will be outlined in Part 2, I have computed the main

Tip Spacing (λ)	Gain (dBS)	Front/Back (dB)	Current Ratio
.001	4.05	17.8	1.12
.005	4.15	16.7	1.08
.01	4.25	15.2	1.04
.02	4.35	12.9	0.99

Table 1 — Variation of performance and Current Ratio with adjustment of Tip Spacing for case C of the double-U design.

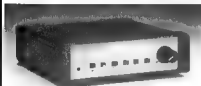
characteristics for a representative range of beams comprising a driven element and a reflector, and these are shown in graphical form in Figure 1. The types covered are Yagi, Straight driven/V Reflector (St/V for quick reference), Double-V and Double-U. The Yagi is included as an essential basis of comparison. There are three variations (A, B, C) in spacing or degree of bending for each type. Cases B and C of the St/V type are similar to the V-5 design of Dick Bird, except the driven element is full-length and not trapped (although at

15 m the trap can probably be disregarded). Case A of the Double-U type is the original VK2ABQ design. The three cases are identified by the dimensions or angles on the small diagrams below the graphs. The dimensions were chosen as being representative and allowing comparisons between the four types of beam, except that the angle for Case B of the Double-V type was determined by a series of calculations to give a current-ratio of exactly 1.0 with a resonant reflector. Thus, this case corresponds to G6XN's basic rule of bending the tips of a Yagi towards each other until the currents in the reflector and the driven element are equal in magnitude.

Cut the noise three ways!



TIMEWAVE
TECHNOLOGY INC.



The DSP-9

The first member of the Timewave family, the DSP-9 provides the basic features of multiple heterodyne elimination, random noise elimination and audio filtering for voice and CW operation. New firmware enhances performance making the DSP-9 version 2 the ideal choice where simplicity and low cost are important.



The DSP-9+

Adds optimised filters for digital mode operation and new flexible choices of characteristics for voice and CW operation as well as extended AGC performance. The DSP-9+ is the ideal choice for those amateurs demanding high performance and flexibility for voice, CW and data operation.



The DSP-59+

With over 300 filter combinations in addition to the features already to be found in the DSP-9 and DSP-9+ the DSP-59+ is suited to any demanding communications application. Has audio bandwidth of 3 kHz maximum and a narrowest bandpass filter of 25Hz for CW which just does not ring! DSP luxury at its best!

\$339
plus \$12 p+p

\$449
plus \$12 p+p

\$629
plus \$15 p+p

DAYCOM
COMMUNICATIONS Pty. Ltd.

37A Fenton Street, Huntingdale 3166
Bankcard, MasterCard Phone (03)543-6444
& Visa all welcome FAX (03)543-7238

Copyright © 1994 Daycom Communications Pty. Ltd. All rights reserved. Prices do not include freight or insurance and are subject to change without notice. MCN 001 619 949

Other points to note are:

- (repeating) All are "free-space" characteristics.
- Gains are relative to a half-wave dipole, 10 dBd.
- The graphs are plotted for a range of values of X_{22} , the self-reactance of the reflector. X_{22} is zero for a self-resonant reflector, positive for a greater length and negative for a shorter than resonant length. The graphs in Dr Lawson's book are plotted against deviation from the self-resonant frequency, in order to show bandwidth. He first calculated gain, etc for a range of X_{22} , as I have done, and then converted X_{22} to deviation from self-resonant frequency, by applying a fairly well known relationship for a dipole. I was doubtful about applying this to bent reflectors. However, Figure 1

does indirectly indicate bandwidth. A graph that is more peaky than another will clearly indicate a smaller bandwidth.

- Graphs of current-ratio (ratio of reflector current to driven current) have been included to be viewed in relation to the claim that design and adjustment for unity ratio produces the best performance.

Comments on Performance Characteristics

Some observations on Figure 1 follow:

Gain — There is no indication that bending of elements can result in increased gain compared with a Yagi and, in fact, there is some reduction, increasing with the degree of bending.

Front/Back — Bending can produce remarkable increases compared with a Yagi, although the very high figures, approaching a null condition, have a very narrow bandwidth, as might have been expected.

Input Resistance — Bending raises the input resistance, and a very high value can result.

Input Reactance — With a self-resonant parasitic, detuning is greater for a bent beam than for a Yagi, not less as has been claimed.

Length of Reflector — Broadly speaking, a self-resonant reflector ($X_{22}=0$) gives the best compromise between gain and front/back ratio for the three types of bent beam, whereas a longer reflector is best for a Yagi.

Current Ratio — Assuming a self-resonant reflector to have been decided on, there remain two more design or adjustment decisions to be made — the element spacing and either degree of V truncation for the St/V type, or the V angle for the Double-V type, or the length of the parallel sections of the elements (and therefore the tip spacing) for the Double-U type. Constructional aspects will naturally restrict the selection. But it appears that making a final selection to give a current-ratio of 1.0 will not necessarily lead to the best combination of gain and front/back ratio. Before leaving the design and adjustment variables of the basic types, it may be of some interest to see the effect on performance of the Double-U type of changes in the spacing between the tips of the elements.

Double-U Tip Spacing

The tip spacing for all three examples of the Double-U type in Figure 1 was 0.001 wavelength or about 20 mm for a 20 m beam. This is a little more than the spacing in the original VK2ABQ design, but much less than for some subsequent variations of that design. The design favoured by G6XN, with an element spacing of 18 wavelengths, has a tip spacing of .026 wavelength in Ref 3, but reduced to .01 wavelength in Ref 5.

The large range of tip spacings determined experimentally suggests that this spacing is not a very critical

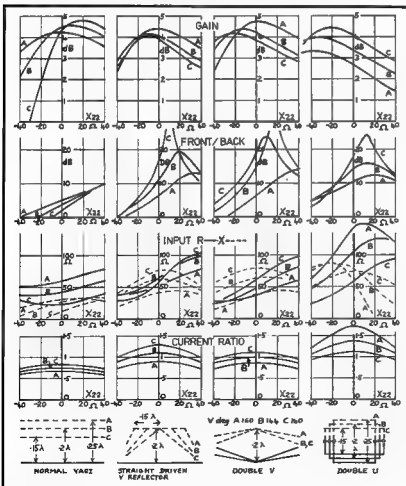


Figure 1 — Computed characteristics of representative 2-element beams.

factor Theoretical support for this conclusion is provided by Table 1, which shows the change in gain, front/back and current-ratio for Case C of the Double-U design in Figure 1, if the tip spacing is increased from .001 to .02 wavelength by widening the element spacing from .15 to approximately .17 wavelength.

Commissioning Adjustments and Performance of the V-5 Beam

My original V-5 beam was badly damaged in the storm that carved a path through northern Sydney in January 1991. During re-building, a toroidal current transformer/rectifier was fitted at the centre of the 20 m reflector and an identical unit was made to fit over one of the feeder connections to the driven element. The 15 m reflector and director were not fitted with similar toroids.

Adjustment of the length of the 20 m reflector started with measuring the driven element current (I_1) and the reflector current (I_2) for a series of reflector lengths with a constant power input to the beam. Although the transformer/rectifiers were checked to be a matched pair, they were not calibrated and only DC mA output could be recorded. The input resistance of the beam was also measured with a noise bridge. Figure 2 was drawn from these measurements and includes the current-ratio I_2/I_1 , which peaked for a

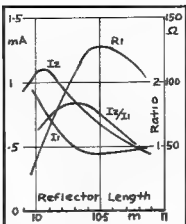


Figure 2 — Measurements on 20 m V-5 beam.

reflector length of 10.3 m, indicating this to be its self-resonant length. The reflector current I_2 peaked at a reflector length of 10.1 m.

Figure 3 was drawn from computer calculations using the as-constructed shape of the 20 m reflector (allowing for the shorter length of the trapped driven element to which it was tied off) and shows maximum gain to occur with a reflector reactance (X_{22}) equal to about half of the reactance for which the reflector current reaches its peak value. Being most interested in gain, and wanting to minimise mismatching, I selected a reflector length of 10.2 m; ie mid-way between the self-resonant length (10.3 m) and the length (10.1 m) for peak reflector current as read from Figure 2.

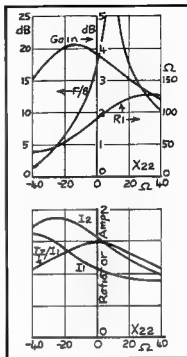


Figure 3 — Computed characteristics of 20 m V-5 beam.

Figure 4 shows the computed characteristics of the three-element 15 m beam with the director self-reactance set at -60 ohm, which a series of calculations indicated to be optimum. I decided to accept a self-resonant reflector, taking its length as 6.82 m from some grid-dip tests done at the very beginning of my

OUTBACKER™

HF MOBILE ANTENNA
1.8 To 30 Mhz

NEW
INFO
VIDEO

TERLIN AERIALS
5 Yampi Way
Willetton W.A. 6155

Send \$ 5.00 for a 15 minute informational video.
Refundable with purchase

Rugged - Reliable - Dependable

Ph (619) 3545444
Fax (619) 4577737

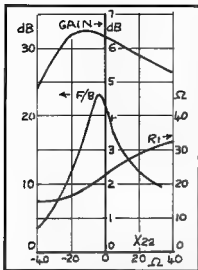


Figure 4 — Computed characteristics of 15 m 3 el V-5 beam.

investigations. Since the director had approximately the same shape as the reflector, its self-resonant length was also taken to be 6.82 m, but the problem was how much to shorten it to give it a capacitive self-reactance of 60 ohm. I decided I could do no

more than use the same percentage reduction that would apply to a straight element, arriving at 6.52 m. Table II gives an idea of the beam's directivity based on reception at a distance of 20 km, but I am unable to give any reliable information on gain.

Azimuth (°)	20 m (dB)	15 m (dB)
0	0	0
45	-7	-9
90	-18	-25
135	-16	-25
180	-10	-20
225	-18	-24
270	-18	-27
315	-8	-9

Table II — V-5 beam directivity.

Qty	Yagi			Strt Drvn V-Ref			Double-V			Double-U		
	A	B	C	A	B	C	A	B	C	A	B	C
Z_{12}	50	55	61	54	58	62	59	67	73	69	69	67
θ_{12}	-35	-21	-7	-32	-42	-40	-24	-37	-44	-76	-63	-45
R_{11}	73	73	73	73	73	73	70	67	65	40	50	59
R_{22}	73	73	73	60	52	48	70	67	65	40	50	59

Table III — Impedance data. Z_{12} = magnitude and θ_{12} = phase angle of mutual resistance. R_{11} = self-resistance of driven element. R_{22} = self-resistance of reflector. Note: As losses are assumed to be zero, radiation resistance and self-resistance are the same.

References

1. Dick Bird, The V-5 System, *Amateur Radio Action* vol 11 No 9
2. G A Bird, The G4ZU V-5 Triband Beam, *The Short Wave Magazine* Nov 1986.
3. L A Moxon G6XN, *HF Antennas For All Locations*.
4. Dr James L Lawson, W2PV, *Yagi Antenna Design*
5. *HF Antenna Collection*, RSGB 1991

Appendix

Table III shows the impedance data (ohm and degrees) for the beams of Figure 1.

(to be concluded next month)

*9 Pentecost Ave, St Ives 2075

AR

amateur radio action

“ Ηουσε αδερπισμεντι Π φορ Αματευρ
Ραδιο Αχτιον μαγαζινε το απκεαρ ιν
ΩΙΑ φουρνναλ Αματευρ Ραδιο Π.

For subscription details to just
about anywhere, phone Grant
Manson on (03) 601 4222

If all this looks Greek to you, perhaps it's because you're not
reading the authoritative source — *Amateur Radio Action*
magazine... at your local news outlet every fourth Tuesday.

The Chinese Connection

Joe Ellis VK4AGL tells the story of a Sister-Club relationship with Chinese Amateurs*



Tsinghua University Amateur Radio club members and friends.

Early in 1993 a packet message appeared on Australian bulletin boards from the Tsinghua University Amateur Radio Club in Beijing, Peoples' Republic of China, with a request for Australian or foreign radio magazines.

The Sunshine Coast Amateur Radio Club responded by sending off packages of magazines, and a further request for an Australian flag was met. As a result of this, a correspondence developed both by airmail and digital radio, with Rick Niu, Public Relations Manager at the University. In a packet message dated Friday, 4 June 1993 Rick asked about the possibility of a sister club arrangement between the University amateurs and our Sunshine Coast Club. A file was opened by us called "The Chinese Connection" to handle this matter.

Our radio club had no previous experience with such a relationship so we set about requesting information from various organisations with knowledge in this field. The Australian Sister Cities Association, and Dr Ray Barrett, Principal of Toowoomba State High School, were of help, and we also made contact by letter and telephone

with Wally Watkins VK4DO. Wally has been a frequent visitor to China since 1980, staying up to 3 months in the country. He was about to leave for Beijing and Nanjing in connection with the IARU Region 3 ARDF contest.

Wally advised that there were no formal rules in establishing relations with an Amateur Radio Club in China. The main purpose was to foster friendship and understanding. In a

sample protocol the Chinese students summed it up this way: *Amateur Radio fosters and encourages international fellowship among all people and nations of the world. The purpose of the agreement is to promote communication and co-operation among amateur radio operators of Australia and the Peoples Republic of China.*

The final protocol prepared by the Chinese students contained eleven clauses, and was accepted unchanged by the Sunshine Coast Amateur Radio Club. The document, signed by all parties, was ceremonially accepted at a general meeting of the club on 3 November 1993 and, as a result, each member of one club becomes an honorary member of the sister club.

For the majority of people in the Republic of China, amateur radio is a relatively new hobby. The Tsinghua University Club is one of the oldest in the country having been established on 29 April 1984, and operates with the callsign BY1QH. The members are young students from the engineering department who are enthusiastically into amateur radio. They also find time to cooperate with a nearby High School radio station BY1BH which was founded by ten students in 1988. There are 82 clubs throughout the nation with 20 or so of these operating club stations in Beijing, Shanghai and Guangzhou.

Regular communication between the Sunshine Coast Amateurs and



Joe VK4AGL hands the completed protocol to club president Ken VK4IS at the conclusion of project "The Chinese Connection".

the Tsinghua University is carried out by amtor/pactor/packet HF links and airmail addressed to Rick Niu, Public Relations Manager of RARC. Digital address is BY1QH @ JA5TX.JPN.AS. Surface packages of magazines take up to three months to arrive in Beijing and two kilograms cost around twenty dollars Australian to send.

The population of China hit 1.1 billion persons during 1992 and the nation is in the process of rapid cultural and economic change. The Chinese have often spoken about how their country and Australia complement each other. In other words we are natural partners. Australia produces raw materials — wool, coal, and iron ore — that China needs to run its industries. In return, China is able to offer Australia a huge market for its products and technology as it expands its industrialisation program.

Stop Press

(This news item was received as we were preparing this issue of Amateur Radio. Prod Ed)

China Ham News July 2 1994

TUARC will be greatly honoured to meet with Hon Tom Burns MLA, Deputy Premier of Queensland, Australia if and when his official visit to the People's Republic of China can be rescheduled later this year.

Mr Burns responded to our sister group Sunshine Coast Amateur Radio Club in May, expressing his willingness to include a Tsinghua University visit in his China tour when Queensland Cabinet Chief Kevin Rudd will also be present. We very much look forward to their showing up in Beijing, and hope this will not only promote amateur radio relationship between Queensland and Beijing, but also trigger international collaborations in a variety of areas between Australia and China.

Rick Niu BZ1QL
Public Relations Manager
TUARC

*Burnside Road Nambour QLD 4560

WIA News

New 80 m Sub-band for JA

Japanese amateurs have been permitted to operate in a new sub-band on 80 metres from 20 May this year.

The new sub-band runs from 3747 to 3754 kHz. This is additional to their existing 80 m allocations covering 3500-3575 kHz and 3791 to 3805 kHz.

Intruder cleared from 20 m

Maintaining a watch on amateur band intruders does work.

The Radio Society of Great Britain's (RSGB) Intruder Watch has scored a success in having a French military station cleared from an exclusive part of the 20 metre amateur band.

The French station was monitored using a 96 baud radioteletype transmitter on 14322 kHz.

Information passed to the British Radiocommunications Agency (RA) bore fruit when the RA brought the intrusion to the attention of the French authorities.

The transmitter was located on Reunion Island in the Indian ocean and has not been reported on 20 metres since the end of January, according to the RSGB's *Press Bulletin for July*.

Commercial Transceivers Covering Two Metres?

In June 1993 the WIA wrote to the then Department of Transport and Communications (DOTAC) over concerns that an application had been made to the Australian Customs Service for a tariff concession on VHF transceivers imported by Motorola.

The concern was that the transceivers' operating range overlapped the top two MHz of the two metre amateur band, 146-148 MHz. The amateur service is a primary service on the four MHz wide 144-148 MHz band in Australia.

The Acting Director, Canberra Customer Services & Technical Team, from the Spectrum Management Agency (SMA), Geoff McMillan, replied to the inquiry in late May this year.

The WIA requested assurance that these Motorola transceivers would not be used on the 146-148 MHz section of the two metre band.

In his reply, Mr McMillan said, "Under the Spectrum Management Agency's present policy, the frequencies in the band 144 MHz to 148 MHz are intended exclusively for amateur service use."

"Similarly our current frequency assignment procedures would not permit non-amateur use of this band without consultation with the WIA."

He concluded by adding a note of regret over the delay in replying.

Stolen Equipment

WIA Federal receives enquiries from time to time as to whether something is on the Stolen Equipment Register, particularly if the inquirers are buying equipment.

It is important that anyone who has had equipment stolen or who is looking to buy secondhand equipment knows that this register exists and that it is kept up to date.

To ensure it's kept up to date, all information for inclusion on this register should be sent in writing to:

WIA Federal
Stolen Equipment Register
PO Box 2175
CAULFIELD JUNCTION Vic 3161
or by fax to (03) 523 8191.

As a new service to members, this stolen equipment register will be available from your Division's office. It is updated on a monthly basis. All enquiries regarding the register should be directed to your Division's office or contact address.

Random Radiators

with Ron Cook VK3AFW and Ron Fisher VK3OM

First off this month, our thanks to Keith Bainbridge VK6XH of *Antenna West*. Keith sells a most impressive range of antennas for HF, VHF and UHF. Keith, why haven't you told us about this before? Anyhow, amongst Keith's range is an antenna that looks very much like our compact loop antenna described in the April 94 edition of *Random Radiators*.

He says he has been importing this antenna for several months. Unfortunately, he didn't tell us where the antenna is made, how it is supposed to work and who has one on the air. We wait with interest, Keith, to find out more about it. By the way, the one pictured in the April issue is still collecting dust in one Ron's garage. If there is anyone out there who would like to try it out on a loan basis, it's available. Drop a note to us care of *Amateur Radio*, first in first served.

Another antenna note of interest. Recently, a "G" friend of one Ron went shopping for a new antenna. He wanted a three element monoband Yagi for 20 metres. He soon found that no such thing was manufactured in the UK and that the only ones available were imported either from the USA or Europe and sold for around \$AUS1000. Well, the outcome was that an antenna imported from Australia could be landed in the UK, with all taxes paid, at well under half that price. Not only that, but I suspect the Australian product might also be of superior quality. Thanks to Andy Coman VK3WH of COMAN ANTENNAS for arranging the whole thing. Andy is a regular advertiser in *Amateur Radio* and deserves your support.

Another Antenna For 80 Metres

Thanks to Rod Torrington VK3TJ for his idea for a short antenna for 80 metres (Fig 1). I know that many amateurs just don't have the space for a half wave on 80, or possibly even

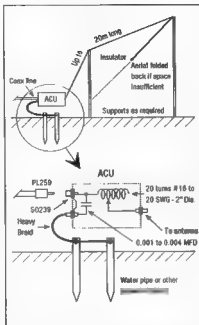


Fig 1 — "Another 80 Metre Antenna".

the 30 metres or so for a G5RV. Rod's antenna requires less than 20 metres. Give it a try, I suspect it will work very well. Over to Rod.

"I am sure that this antenna could be used on all bands with an appropriate ATU, maybe even a Z Match. Now, the Editor has told us that we have more than enough on Z Matches for the time being and that

we should go quiet for a while. OK, but how about this. A certain Adelaide radio club had a Z match night a while ago. (See "Club Corner" in this issue. Prod Ed.) Seems that members brought along their versions of the Z match and compared notes.

Now that's a wonderful way to encourage home brewing.

On to the 80 metre antenna. There is nothing new in the concept of this antenna. In fact, it is the same as used with spark transmitters nearly 100 years ago. Perhaps it is not as well known now as it was then.

As amateurs often want an 80 metre antenna in a confined space, it is brought to attention. It may be known by various names, but the Grounded Marconi is thought to be the favourite identification for this type of aerial coupling.

The aerial may be of any length up to approximately a quarter wavelength on 80 metres (20 metres, or 66 feet) and aerials shorter than a quarter wavelength are built up to approximately a quarter wavelength by the inductor in the aerial coupling unit (acu). The acu (the inductor and the capacitor — 0.001 to 0.004 mfd) may need to be enclosed in a box and is located adjacent to the ground connection.

While extensive ground mats are ideal with this type of antenna, experience has shown that grounding arrangements occupying a minimum of space, which may be considered quite inferior, will work and get a signal on the air. As a start for the grounding system, try a couple of pipes, say 3/4 inch water pipe or similar, into the ground to a depth of 50 cm or deeper.

ATN ANTENNAS

Ask for a free catalogue

We manufacture a comprehensive range of HF, VHF and UHF antennas, baluns, power dividers etc. Log periodicals provide continuous coverage from 13-30MHz (incl WARC) and replace outdated in-banders. Now in use in 38+ overseas countries and six continents. 10-30 MHz & 7-30 MHz extra heavy duty available late 1993.

- Rotators by Create, coax cables & non-conducting guy/halyard materials
- B&W all frequencies 1.8-30MHz and fed vee. All frequencies 3.5-30MHz folded dipole 10W, 100W, 1kW. No radials required.
- Hard-drawn copper antenna wire and insulators.
- AustINZ distributor for Create antennas/rotators & Phyllystran (Kevlar) guying materials, Diamond 80-40 & 80-10 dipoles
- High gain VHF & UHF amateur, scanning & TV antennas
- Butt section triangular aluminium towers for fixed or tilt-over applications re/for (March/April 1987 AR)
- Selections of power chips and TX tubes at friendly prices
- VSWR/PWR meters by Diamond to 1300MHz 10 models. All in stock.



56 Campbell St, Birchup Vic 3483

Phone: (054) 92 2224

Fax: (054) 92 2666.

if possible. If more than one pipe is possible, they are bonded together with high conductivity braid or heavy copper wire. An old metal TV chassis about 50 to 60 cm square, buried 50 to 60 cm and well watered, has been used with success (We recommend the use of a 2 metre long earth stake driven at least 1.5 metres into the ground as a minimum earth. These stakes can be bought from electrical trade stores. Of course, a better arrangement for RF earthing is 20 radials, 0.1 wavelength long, buried under the feed point. The two Rons).

The earth terminal on the acu should be adjacent (50 cm or less) to the earth point and should be joined with heavy braid. A short piece of co-axial cable (RG8U) using both the inner and outer braid is good for this purpose. It is suggested that the cable be soldered to the pipes or chassis to ensure a trouble free connection.

Co-axial feeder line (50 ohm) is used from the transmitter to the acu and should be terminated in a plug (PL259, for example); the acu will require a mating socket (SO239). While these plugs and sockets are not essential, it is very convenient to insert the VSWR meter at this point when adjusting the aerial as there are three variables to consider.

It is also desirable to be able to key the transmitter from the acu position,

so temporarily extend the key leads out to this location. Firstly, adjust the transmitter controls on low power with the transmission line terminated into a dummy load at the acu. The transmitter should then be able to accept, for short periods, the out-of-resonance aerial condition during aerial tuning. The inductor should be of such construction that each turn can be readily tapped. The amount of inductance required will depend on the length of the aerial compared to the quarter wavelength but, as a starting point, a coil of, say, 5 cm (2") diameter and of 20 turns should accommodate most proposed aerials. Preferably, the aerial length should be adjusted so as to require only one or two turns of the inductor to achieve resonance at the desired frequency.

If a grid dip oscillator (gdo) is available, probably all aerial tuning can be done with the gdo coupled to a one or two turn loop connected to the SO239. Starting with a 0.001 mfd capacitor across the input to the acu, adjust the inductor and the aerial length to be resonant at the desired frequency. This resonance can be placed at any part of the 80 metre band, usually at a favoured frequency of operation. Then, with the transmitter feeding the aerial, adjust the capacitor and the inductor for minimum VSWR. As an example of what can be expected, an installation

adjusted for 3670 kHz gave 1:1 at that frequency, while at 3800 kHz it was 1.5:1, at 3550 kHz 1.6:1, and 3500 kHz 2.25:1.

If it is found that the aerial is too long when adjusting at the desired frequency, it is preferable, at this stage, to wind the excess length back along the aerial itself instead of cutting it off, in case the aerial has to be lengthened at a later stage in the tuning procedure. The terminating capacitor used was a 500 volt mica type from a valve broadcast receiver of other years. This has been quite satisfactory in this application.

This method of aerial loading is used in aircraft where aerials as short as 32 feet (9.7 m) on small aircraft are required to operate on frequencies of 2.8 and 3.4 MHz."

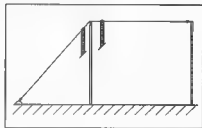


Fig 2 — Layout of the special multiband antenna.

A Special Multiband Antenna

It's said there is nothing new under the sun. When it comes to antennas I am sure that's true. A letter from Dave Jenkin VK4CEU (ex VK3ABR and VK7XO) brought an old one back to mind that we thought might be worth describing. After all, not many of our current readers have *Amateur Radios* back to 1953. I will let Dave tell the story.

"I lived in Box Hill, Victoria, for many years going back to the early fifties and there was one antenna which fired me up. A seemingly simple thing, it was written up in *Amateur Radio* for March 1953. Its author inspired me greatly with this antenna and other things. He was Hans J Albrecht VK3AHH (ex DL3EC). The title of his article was 'A Special Multiband Antenna'. I tried this antenna from three different locations and found it very good on 20 metres. In the late 70s I put one up at Box Hill with three

WIA News

Tower Standard

Standards Australia has released a new standard on the design of steel lattice towers and masts for communications purposes, which would be of wide interest to amateurs.

Standard AS 3995 sets out procedures for determining design wind speeds and wind loads to be used in the structural design of such steel lattice towers and masts.

The basis for the strength assessment of members and lattice connections is set out in the Standard, which also incorporates design and analysis of guyed masts of this type, the design of

cable tension members, footing design and criteria for assessment of existing structures.

In fact, as if the foregoing weren't comprehensive enough, the Standard provides additional guidance on maintenance, inspection and access in appendices.

Standards Australia notes that AS 3995 is not intended to apply to the design of transmission line structures. In addition, the design of aluminium and cold-formed steel structures, other than those complying with AS 1163, is not covered by AS 3995, except in relation to access to the lattice towers and masts, says Standards Australia.

masts at 30 feet and a three wire feeder which Hans states in his article would do the same job as his four wire system. It was possible to change the lobe directions by feeding the two sections either in or out of phase. Hans claimed 5 to 6 dB gain with it fed in phase and 6 dB out of phase, compared to a 20 metre dipole. I never came across anyone who had actually tried this antenna apart from Hans and myself"

Well, Dave, at least one of the Rons remembers the signal that Hans put out and the DX he worked (the other Ron is too young!). So back to 1953 for an edited version of the original article.

"The antenna consists of a horizontal section and a semi vertical section. Each section is 67 feet long, thus a full wavelength on 20 metres which we shall take as the reference band for this description. Two poles hold the horizontal section at a height of about 30 feet while the semi-vertical section slopes down at an angle of about 26 degrees with respect to ground. The bottom end is held about one foot above ground. The feeder

used consists of two separate open-wire lines, each of which supplies RF to one section of the antenna. However, a triple wire feeder may be substituted without effecting the final result. The separate feeders (or three wire feeder) allow both sections to be used separately or both combined and fed in or out of phase. The length of the feeder has to be such that it operates as a resonant open wire line on all bands. Thus the lines were made about 34 feet long.

Fig 3 shows how the different phase connections are obtained at the antenna coupling unit which is of ordinary construction."

We recommend the use of a Z match for the antenna coupling unit and this will give operation on all bands from 80 to 10 metres. Hans calculated the radiation patterns for 20 metres and these are published in the original article but, due to space, will not be reproduced here. In basis, the in phase condition gives major lobes at 60, 120, 240 and 300 degrees, while the out of phase condition gives lobes at 40, 140, 220 and 320 degrees.

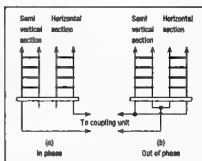


Fig 3 — Connection of feeder lines from the special multiband antenna at the antenna coupling unit. (a) In phase. (b) Out of phase.

A three wire feeder can be easily constructed using plastic spacers to give a total width of about 5 cm or two runs of slotted 300 ohm ribbon could be substituted. In many cases it would be simple to modify an existing antenna. Give it a try.

Well that's enough to keep you going for the time being, so its good bye from him and good bye from me.

The two Rons.
BR

Strictly Ham Pty. Ltd. ACN 059 638 407

14 Church St, Bayswater. VIC. 3153
PH: (03) 729 7656 FAX: (03) 729 7422
Mornington Peninsula Call 059 839 162 AH 018 330 583

ALICCO
DIGI-ALICCO BAND MOBILE \$1190.00
DIGI-LIGHT 2M MOBILE \$895.00
DI-560T 2M/70CM HANDHELD \$629.00
DI-ET 2M HANDHELD \$599.00

ALWA
SWR POWER METERS FROM \$189.00
ALWA POWER SUPPLIES FROM \$179.00
COAX SWITCHES FROM \$69.00

KENPRO ROTATORS
RR-400 \$895.00
KR-400RC \$678.00
RR-1000 \$1135.00

AEA DATA CONTROLLERS
PK-900 \$1250.00
PK-1250 \$1495.00
DSP-1232 \$1495.00
DPP-1232 \$1195.00

MALDOL ANTENNAS
WE CARRY MANY MALDOL BASE AND MOBILE ANTENNAS IN STOCK.
MOBILE ANTENNAS FROM \$75.00

COAXIAL CABLE
RG-213/U \$100.00 PER 100M ROLL
RG-58C/U \$95.00 PER 100M ROLL
ALL COAX IS MIL SPEC

ACOM AM-3000A
SHOW US YOURS FOR
BEST PRICE
CALL FOR QUOTATION

YET - ENTEN
WE CARRY A GOOD
RANGE OF YET - ENTEN
ANTENNAS FOR WHATEVER
YOUR HF REQUIREMENTS

WATSON ANTENNA SYSTEM
FROM THE WORLD'S SMALLEST OF TRANSDUCERS THE T-800 TO THE
FLAGSHIP OF THE RANGE THE T-800SDX, WE CARRY THE ENTIRE RANGE
ON THE SHIP.

MELBOURNE'S BIGGEST KENWOOD SPECIALIST

ICOM ANTENNA SYSTEM
WE ALSO CARRY A LARGE RANGE OF ICOM ANTENNAS AND
ACCESSORIES IN STOCK
WE HAVE A LARGE RANGE OF DIAMOND ANTENNAS IN STOCK



DUAL BAND BASE ANTENNAS 2m/70cm
X-30 3.0db/8.5db \$129.00
X-80 4.5db/7.2db \$149.00
X-200 6.0db/8.0db \$199.00
X-300 6.5db/9.0db \$229.00
X-400 7.0db/11.0db \$299.00
X-530M 8.3db/11.7db \$349.00

TRI BAND BASE ANTENNAS 2m/70cm/23cm
X-4000 3.1db/6.3db/9.7db \$249.00
X-8000 4.5db/8.3db/11.7db \$279.00
X-6000 6.5db/9.0db/10.0db \$309.00
X-7000 8.3db/11.7db/13.7db \$399.00

WE ALSO CARRY TRIPLEXES AND TRIPLEXES FOR WHATEVER YOUR
REQUIREMENT FOR 10M, 6M, 2M, 70CM AND 23CM
ALSO MOBILE TRIBAND ANTENNA FOR 3/70/23CM, 8/2/70CM,
10/2/70CM, 15-10/2/70CM

Technical Abstracts

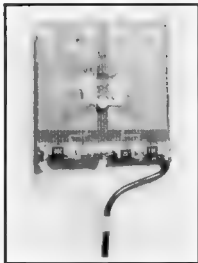
Gil Sones VK3AUI

Simple 10 GHz Transmitter

A simple transmitter, consisting of a GaAsFET oscillator with the printed circuit tuned lines acting as the antenna, was described in the April 1994 issue of the Swiss magazine *Old Man* by Dr Angel Vilaseca HB9SLV and Jean-Pierre Morel HB9RKR. The output is 1 mW approx, which is adequate for short range using a small dish. The receive system used was a converted satellite TV system.

service. Locally, MGF1302s are readily available and should work. Try the VK5 component service.

A photo of the circuit board is shown below.



Complete Oscillator

The whole oscillator is placed at the focus of a small parabolic antenna. A satellite dish could be used or some other small dish would be suitable. The authors tried a lampshade sold in Europe by IKEA with some success. Imperfections in the curve of the dish will reduce gain but are not catastrophic.

Video is coupled to the gate and FM modulates the oscillator. The receiver used was a satellite TV system coaxed onto the 10 GHz band. The receiver used has good sensitivity and compensates for the low output of the oscillator.

Thanks are due to John Martin VK3KWA for his translation of the original article in *Old Man*.

Cable Length Measuring Circuit

Estimating the length of coaxial cable in a coil or on a drum is a difficult task without unrolling and measuring it. You could count the

coils and estimate the circumference but, without actually unrolling the cable, the result is a guess even if it is reasonably intelligent. In the ARRL publication QEX for April 1994, George Brown G1VCY described a simple circuit for estimating the length of a coaxial cable.

The circuit uses a delay line oscillator with the cable acting as the delay line. A Schmitt trigger inverter is used in the oscillator circuit. The inverter is a TTL NAND gate and the only proviso is that the gate propagation delay is small compared to the cable delay to be measured. The circuit is shown in Fig 2. The delay of the cable is equal to half the period of the oscillation. For cables down to 5 m in length a 74LS00 is only just acceptable and a 74AC00 is preferable.

For coaxial cable with 0.66 velocity factor, Fig 3 graphs length and signal delay. The velocity factor of various cables is given in Table 1.

To measure the delay you could use an oscilloscope or a counter. If the delay is too short for your oscilloscope then you could feed the oscillator output through a divider circuit to obtain a lower frequency and a longer period.

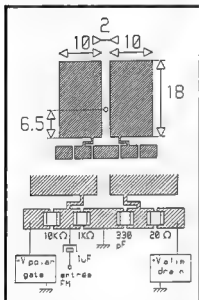


Fig 1 — Circuit Board Layout and Components.

The circuit uses the layout shown in Fig 1. The FET is the dot 6.5 mm up the lines. The lines have a 20 ohm impedance. The lines radiate and act as the antenna. The Drain voltage is between 3 and 4 volts and the Gate voltage -4 volts.

Frequency and output depend on the 6.5 mm dimension as well as the 18 mm line length. Some experimentation is necessary. The prototype used a range of 6.5 mm to 8.5 mm with oscillation ceasing at 8.5 mm. The GaAsFETs used were surplus types from satellite TV

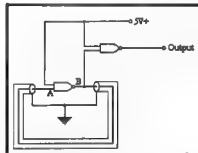


Fig 2 — Delay Line Oscillator.

Recovering Small Parts

Often small parts fall on the floor and disappear into the carpet or are invisible on the vinyl. In the "Hints and Kinks" section of QST for May 1994, Jim Roux W4YA has a technique for recovering small parts.

Jim holds a nylon stocking over the vacuum cleaner hose with a rubber band. The vacuum cleaner will suck the part up and it will be held by the nylon mesh of the stocking.

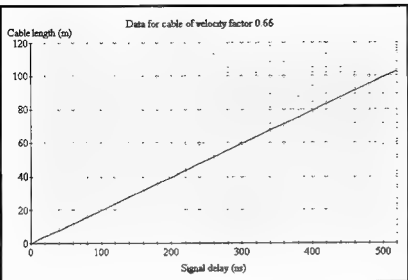


Fig 3 — Signal Delay for Cable Lengths of 0.66 Velocity Factor Cable.

Table 1 — Characteristics of Some Well Known Coaxial Feeders

Cable Type	Impedance (Ω)	Velocity Factor	Approx UR Equivalent
RQ58/U	53.5	0.659	UR43
RQ213/U	50.0	0.66	UR67
RQ58C/U	50.0	0.659	UR76
—	0.0	0.96	UR83

Handy Padded Handheld Case

An oven mitt makes a handy padded holder for a handheld transceiver. The thumb of the mitt can hold an adaptor or other small item. The padded mitt protects the handheld when carried in your brief case or suit case.

This tip was also published in the "Hints and Kinks" section of *QST* for April 1994. The tip came from Nona M Norman N8CKS.

RF Sniffer Meter

An RF sniffer, which can be used to sniff out the presence of RF, is a handy item. You can find out where RF has appeared in odd places and you are then well on the road to a cure to unexpected power supply and audio amp, etc behaviour.

An interesting design for a sniffer appeared in the "Hints and Kinks" section of *QST* for April. The design is that of Emerson Hoyt WX7E and it is a neat and simple unit. The meter should be fairly sensitive and a 100 microamp or better meter is desirable.

The circuit and construction is shown in Fig 4. Germanium diodes are preferable due to their low forward voltage.

Alternative construction can be used but the main thing is adequate support for the components and the

probe wire. You could use a tag strip or a scrap of Vero board.

The unit is used to probe about for an indication. Be careful in the vicinity of high voltages. Hot spots in circuitry or coax cable leakages should be readily apparent

Auroral Sounds?

A very interesting item concerning instantaneous sounds from a variety of natural phenomena appeared in the May edition of the *Solar Geophysical Summary* from IPS Radio and Space Services. The author was Colin Keay.

Sounds have been reported which are instantaneous with the phenomena from a variety of phenomena such as Aurora, Fireballs, Lightning, and Earthquakes. These sounds would appear to be due to the interaction of a strong electric field from the phenomena with objects surrounding the observer.

The item was brief and those interested should obtain a copy of the *Solar Geophysical Summary* for May, 1994 from the IPS Radio and Space Services. Larger libraries and, in particular, the libraries of large educational institutions may be able to help. The article has references to other publications and you will need a good library to track them down.

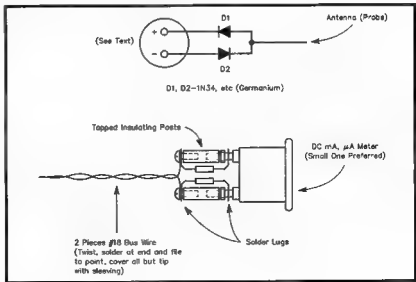


Fig 4 — RF Sniffer.

THE 21st CENTURY

COMM. RECEIVER IS HERE TODAY

THE FABULOUS

SoftWave

SoftWave is the first fully integrated digital communications receiver for Microsoft Windows. SoftWave combines a high performance receiver, digital signal processor, spectrum analyzer, database and Windows program in one product. It opens the door to wireless communications on the PC.

GENERAL FEATURES:

Includes HF receiver, VHF Scanner, AM DX Radio, World Map Radio, Digi. Signa. Processor, Spectrum Analyzer, Oscilloscope, Signal Constellation, Multi-Mode Demodulator/Decoder Database and Windows program in one product.

All power and signal for the external receiver unit come from the PC by way of the RS-232 cable (included).

Will operate in the background while you use other Windows applications. Simple installation does not require changes to jumpers or bus address. Accurate display of signal strength in dBm. Seven digital demodulators including: AM, Synchronous AM, FM-XPR (Cross Prod.), FM-PLL, CW, CW-NB (Narrow Band), CW-TT (Tone Tag), 48 digital IF filter bandwidths from 11kHz to 49Hz. Continuous coverage in HF, 0.5 to 30 MHz and VHF, 108 to 174 MHz. One hertz tuning resolution. Tunable notch filter with 60 dB attenuation. Real time spectrum analyzer. Real time oscilloscope or a signal constellation and many other features. **TOO MUCH TO TELL YOU - GET YOUR BROCHURE!**

The SG-230 SmarttunerTM

HERE AT LAST

NEW

Whether you are a **HAM, LAND MOBILE, MARINE** or **AIR BAND** operator, you need an efficient antenna coupler. The best on the market today is definitely the SG-230 made in USA by SCG,

Inc. The SG-230 is a fully automatic antenna tuner, with locking feature, where a computer system continuously monitors all antenna

parameters and instantly selects the right values from more than half a million combinations in its matching circuit to make sure everything is perfectly tuned. With 500 position non-volatile memory build in, and a memory management program, there is only one word for SG-230 HF **AUTOMATIC ANTENNA COUPLER - RELIABILITY! PRICE \$795**

COMM. RECEIVERS

At Emtronics you can source the largest range of Short wave Radios for professional, amateur and SWL.

LOWE HF 225 \$1450 HF-150 \$895
AOR AR3030 \$1590 AR3000A \$1950
JRC NRDS35G \$ call NRDS35D \$ call
KENWOOD R5000 \$ call
ICOM RI \$ call RI100 \$ call
R22 \$ call R2100 \$ call R5000 \$ call
CALL FOR FURTHER INFO & BROCHURE

DIGITAL SYSTEMS

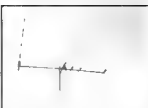
AEA DATA CONTROLLERS represent the most exciting value in amateur radio today.



DSP-1232 \$1495 DSP-2232 \$1895
PK 000 \$1250 PK 232MBX \$695
PK 88 \$295 PK 96 \$499
PC-PAKRA1 for Windows \$250
AEA FAX \$275
ST-1 Satellite tracker \$775

TET-EMTRON ANTENNA SYSTEMS

TET-EMTRON antennas are Australian designed and made and are now exported and known all over the world. You will find TET-EMTRON in Europe, South Africa, New Zealand, Japan and Korea and America. Why? Because TET-EMTRON systems are innovative, reliable and manufactured from top grade materials.



WORLD'S LARGEST CHOICE OF HF-BEAM ANTENNAS

BEAMS FOR 14/21/28MHz

TE-13 rotatable dipole	\$199
TE-21 2 element beam	\$414
TE-23M 2 element run-beam	\$440
TE-33 3-element beam	\$575
TE-43 4-element beam	\$750
HB-35C 5-element trapless beam	\$770

BEAMS FOR 7/14/21/28MHz

TE-14 rotatable dipole	\$275
TE-34 3.1 element beam	\$695
TE-44 4.1 element beam	\$870

BEAMS FOR 160/80/40/30/20/15/10MHz

TE-26 dual rotatable dipole	\$360
TE-46 3.1 element beam	\$750
TE-56 3.2 element beam	\$950

10% discount
ON ALL ANTENNAS FOR AUGUST

STANDARD - the world's most advanced VHF- UHF mono & dual band radios. You no longer have to "CRAWL" under the DASHBOARD to read the dial! Now all controls and display are in your little hand. *Send for brochure*



KENWOOD & ICOM

Best prices from EMTRONICS

POWER SUPPLIES GALORE

THE MOST ECONOMICAL 20A POWER SUPPLY AVAILABLE!



MODEL
K205
\$365

This unique regulated power supply will run all your

HF/VHF/UHF transceivers and can also be used for many other applications as well. Input 240Vac Output 13.9Vdc at 20Amp.

THE BEST 30A POWER SUPPLY AVAILABLE! MODEL EMTRON



EPS-30

EMTRON EPS-30 IS THE EXCITING NEW DC POWER SUPPLY FOR

PROFESSIONAL AND AMATEUR APPLICATIONS. This unique power supply incorporates 4X protection (voltage, current, temp. & RF), and a dual cross-needle V/A meter! **\$575**

EMTRONICS

SYDNEY
HEAD OFFICE
94 Wentworth Ave
SYDNEY 2000, AUSTR.
Ph (02)211 0988
Fax (02)281 1508

QUEENSLAND
639 Logan Rd,
GREENLOPES
QLD 4120
Ph (07)394 2555
Fax (07)394 4316

WEST AUSTRALIA
TOWER COM.
Shop 3, 443 Albany
Hwy., VIC. PARK
Ph (08)470 1118
Fax (08)472 3795

VICTORIA AGENT
Ph (03)700 5428

AMSAT Australia

Bill Magnusson VK3JT*

National co-ordinator

Graham Ratcliff VK5AGR
Packet: VK5AGR@VK5WI

AMSAT Australia net:

Control station VK5AGR

Bulletin normally commences at 1000 UTC, or 0900 UTC on Sunday evening depending on daylight saving and propagation. Check-ins commence 15 minutes prior to the bulletin.

Frequencies (again depending on propagation conditions).

Primary 7.064 MHz. (Usually during summer).

Secondary 3.685 MHz. (Usually during winter).

Frequencies +/- 5 kHz for QRM.
AMSAT Australia newsletter and software service

The newsletter is published monthly by Graham VK5AGR. Subscription is \$30 for Australia, \$35 for New Zealand and \$40 for other countries by AIR MAIL. It is payable to AMSAT Australia addressed as follows:

AMSAT Australia

GPO Box 2141

Adelaide SA 5001

the registration rights to AMSAT-NA. As a result of a recent approach to Chris by Graham VK5AGR, AMSATVK is now authorised to issue registration of WiSP. To register your copy send \$AUS40 to Graham at AMSATVK at the above address. All funds so raised will go towards the planning, building, launching and commissioning of more amateur radio satellites. This is a wonderful gesture by Chris and it deserves all our support.

It is a joy to watch WiSP in action. The screens are very user friendly and informative. Anyone having some experience with MicroSoft Windows will have no difficulty coming to grips with WiSP. A couple of minutes before the pass, WiSP springs into life announcing with a chime that an "event" is about to happen and giving the operator the opportunity to cancel if required. It can be set to totally ignore passes below a maximum of (say) 10 degrees. Clicking on the OK button initiated an immediate response with the rotators automatically moving into position and the transmitter

and receiver tuning racking around at a fast rate of knots to keep track of the changing Doppler shift on both up link and down link. When the satellite eventually rises a degree or two above the horizon (the signal should be 9++ at this stage), the program begins automatically intercepting files being broadcast by the satellite.

WiSP allows the operator to select all manner of options for downloading priorities. The priorities range from selection of specific files, including the option to reject certain categories all together, right through to the "grab all" mode. You can also set to accept or ignore the comprehensive telemetry information being broadcast. Telemetry interpretation is a passion of mine so this feature is of particular interest.

At the same time the software is displaying the current status of uploading. It shows the "queue" of ground stations waiting their turn to upload data to the satellite. If you have outgoing mail in the queue your call sign appears highlighted in red and you can watch it advance up through the queue. When it reaches the top of the queue the transmitter springs into life. Uploading and downloading proceed simultaneously as the system is full duplex. The software continuously monitors the state of your uploading and

Please Note.....

As indicated in the header, Graham has had to increase the membership subscription fees. The fees have remained static for some time now but inflation has finally caught up. Considering the wealth of information in the newsletters and the other benefits of membership, such as the software service and access to ordering various bits of hardware, etc, etc, the subs represent great value.

WiSP Software

I recently had the opportunity to watch this program in action. It's great WiSP is a "Windows" program which will completely automate a satellite ground station using the digital MicroSats. It was reviewed comprehensively in the May 1994 AMSATVK Newsletter No. 109. WiSP was written By Chrs ZL2TPO and he is to be congratulated on a remarkable job. I believe WiSP will go on being refined and eventually become the "industry standard" for digital micro satellite operation in much the same way that InstantTrack has become for satellite tracking.

Chris has made his program available to AMSAT as a fundraiser and has given

QSP News

VK4JAW and the Balloon Attempt

Steven Griffin VK4JAW, the lone balloonist is on firm ground again in his Brisbane home.

He left Carnarvon (VK6) during the night of 6-7 June, and landed after 56 hours and 30 minutes of flying, at Mt Wilkin (near Clermont just north of Emerald in Northern Queensland) in the early hours of Thursday 9 June. The total distance covered was approximately 3200 kilometres, which is about 440 kilometres short of the distance travelled by Dick Smith VK2DIK and John Wallington in the same balloon a year ago. Steven set a new record having reached 26,200 feet in altitude.

During the flight Steven wore heavy protective clothing, as the night temperatures were as low as -25 degrees Celsius. He also kept on the oxygen mask most of the

time and managed only one and a half hours sleep during his flight. He had some problems with the gas burners and ran out of his oxygen supply when he started the descent. His electrical power supply on board was car batteries, which he charged with two 53 watt solar panels during the day. Steven listened on the 80 metre amateur band on 8 June, but the frequency of 3605 KHz was very busy on that evening with local and interstate traffic.

Quite a number of VK5, VK3, VK2 and other amateurs kept a listening watch on the nominated frequencies during the flight, but Steven was unable to become active due to his more important tasks as a balloonist. He asked me to thank the amateur fraternity on his behalf, for the interest shown in his venture and for the anticipated assistance should the need have arisen.

Stephen Pall VK2PS

displays a summary of what's going on including a percentage count and a success rate in characters per second.

The multi-tasking aspect allows you to select editor mode and compose a reply to a bulletin or personal mail while all the rest is going on in the background. When you are happy with the file it will be automatically queued and transmitted. In this way it is possible to exchange messages with another station in the footprint as a pass progresses. In the meantime, of course, the auto-track application is moving the antennas and tuning the transmitter and receiver. A small pop-up window allows monitoring of the footprint in an "InstantTrack-like" screen. Any files received are put away into their appropriate directories ready for reading after the pass.

There are six programs in the WISP suite. They are, GSC, Ground Station Control; MSPE, MicroSat Protocol Engine; View-Dir, View Directory; MsgMaker, Message Maker; ProcMail, Process Mail; and MsgView, Message Viewer. They are all interactive in that they let each other know of any events that may be of importance to another part of WISP, eg messages composed in MsgMaker are automatically queued ready for uploading by MSPE.

The uploading and downloading of files and messages to and from a MicroSat is a very complex business. With WISP, Chris has succeeded in producing a ground station controller that is comprehensive and yet easy to use. It is quite exciting to see it all happening. Anyone contemplating a move to the digital satellites, in particular UoSAT-22, KiSat-23 or KiSat-25 would do well to go with this software

Review of OSCAR-10's Attitude

In a recent packet radio bulletin, James Miller has announced that further examination of the signals from OSCAR-10 has indicated it is moving into a much more favourable attitude with the antennas pointing towards earth more often than they have been over the past several years. This is great news and warrants mention in this column.

OSCAR-10's receiver was, and probably still is, very sensitive. I can recall having put a readable signal through OSCAR-10 with an uplink power of 100 mW to a 20 turn 70 cm helix with the satellite at 40,000 km range. If the old bird is coming good again it should be worth watching.

Remember, however, that it is quite out of control. Radiation damage to the CPU rendered it uncontrollable several years ago and it has been drifting ever since. This means that it is not possible for

control stations to adjust the attitude so that it receives enough solar power to keep the battery charged. Sometimes it's on and sometimes not. You will have to take pot luck.

If, however, squirt angles are improving then the solar power situation may also improve as a result of the better attitudes. I have run the figures through InstantTrack and it seems that quite useable squints

may occur for the next couple of years. James is looking for confirmation or otherwise of his observations so he is asking for folks to gird up their loins, listen to or work through OSCAR-10, and report your findings to him (or me and I'll pass them on).

*359 Williamstown Road, Yarraville VIC 3073
Packet VK3J7@VK3BBS

ALARA

Marilyn Syme VK3DMS

Unfortunate news from VK4 is that the GYLS have had to disband, but they did plant a tree, in memory of Eleanor VK4BEM, which is flourishing. Mary, the present holder of VK4BEM, is leaving VK4 to take up residence in VK2. Recently she and her OM Ray VK4QH spent a week at Camp Quality on the Tweed. She says it was exhausting but exhilarating operating the special event station V12CQ, during which she made contact with Christine WB2YBA (YLRL President) who was visiting Australia with the call VK4AZJ. Christine passed greetings to all ALARA members.

Another reminder is in order about the YL Meet in Bundaberg on the weekend of 2 to 4 September next. All interested YLs and families are welcome to attend. More information can be had by contacting Robyn VK4RL on 079 228 1700, Mary VK4PZ on 079 342 910 or Julie VK4BJJ on 071 534 480. Packet messages can be sent to Robyn VK4RL @ VK4WIR

Judy VK3AGC took herself off to Kambalda in May to visit her new

grandson. Her route went via Mildura, where she had lunch with me the same day as THE wedding. She caught up with Poppy VK6YF in Perth, and then came back through Adelaide where she spent a night with Christine VK5CTY, had coffee the next day with Jenny VK5ANW and Denise VK5YL, then went on to Murray Bridge to stay a night with Meg VK5AOV.

We all know that Joan VK3BJB does all sorts of unusual things involving activities of her Japanese amateur friends but recently she surpassed herself. This latest foray created all sorts of hassles never dreamt of! A friend of some 12 years standing, Shuzo JE2RQC, asked her if she could organise his Australian western style wedding IN MILDURA!!! Now, if you think organising your own daughter's or son's wedding takes time — well, double the difficulty! With only two months to complete details the telephone and fax between Japan and Australia ran hot. With very little idea of what expense the couple could really afford, things were set in motion. Even trying to hire formal wedding outfits in a country town is an



Shuzo JE2RQC, Satomi, Joan VK3BJB and Ray VK3BRE in the shack of VK3DMS.



Shuzo JE2RQC and Satomi, with Ray VK3BRB and Joan VK3JB in the background, outside the chapel after the wedding.

interesting exercise, but somehow it all fell into place. Everybody who was approached to help was delighted to be involved because it was the first time that a Japanese couple had flown to Mildura especially to be married. Eventually even the Mildura City Council became so interested that they arranged a mini civic reception for the bridal couple after the ceremony to formally welcome them to Mildura.

So we come to THE days of what was a very short visit. With only 9 days annual holiday, Shuzo and Satomi arrived in Mildura on Monday 23 May on the morning flight from Adelaide. The rest of that day was spent rushing around meeting the minister, rehearsing at the chapel, and having fittings for their formal wear. In between they managed to fit in a quick tour around the district, including a visit to the home of Marilyn VK3DMS.

Tuesday morning was spent catching the train before the ceremony. By 1 pm the chauffeur had arrived and the action began. Shuzo got himself ready first so Satomi could see him in his formal gear before she dressed. After he had left with Ray VK3BRB, Joan wrestled with the many pearl buttons and loops. These

gave considerable trouble, leading to the bride being almost 20 minutes late. By this stage Shuzo was VERY edgy! Then when Satomi arrived, we all thought the wedding march would never start! Finally everybody was in place and the ceremony proceeded. It was a very lovely service in a chapel that is situated at the elderly peoples' home, and many of the residents came in to enjoy the wedding. Coming out of the chapel, Shuzo and Satomi were completely overwhelmed by the interest and welcome shown by everybody around. Next followed a trip to the photographer for formal photos, and on to the civic reception. After a rest back at Ray's and Joan's home, Satomi changed into a formal kimono for dinner at a local restaurant.

The following morning the couple flew out of Mildura for a four day honeymoon in Melbourne and Sydney before returning to Japan. Joan reports that they rang her as soon as they arrived home, but that she is still recovering! Little did Joan realise when she decided to learn some basic Japanese for QSOs to J land, that it would all lead to maritime nets, yacht rescues, tourist information AND arranging weddings!

ar

Help stamp out stolen equipment — keep a record of all your equipment serial numbers in a safe place.

icom

Count on us!



"VK3LZ calling!"

All the latest news from your friends at Icom.

Special prices on IC-2SRA. Interested in a 2M handheld with a built-in wideband receiver? We have a very limited quantity at special prices so don't delay... call us soon!

The outstanding IC-738 is here.

The latest HF unit has arrived. Features include a built-in tuner, SWR meter, ALC and 1Hz tuning steps. It's an absolutely superb rig. If you're interested in remarkable performance call us for a brochure.

"...73"

Call me at Icom on
free call (008) 338 915
ph: (03) 529 7582
fax: (03) 529 8485

ACN006 092 575

AWARDS

John Kelleher VK3DP — Federal Awards Manager*

The following information on Spanish HF Awards was graciously sent to me by Julio EA4KR, with the permission of URE (Union de Radioaficionados Espanoles).

Diploma Espana

This Award can be earned by all licensed Amateurs (and SWLs) for making contact with Spanish stations on SSB and CW. Contacts with or from Mobile stations are not valid.

Applicants are required to work and confirm 10 stations from each EA area 1-8 with five contacts from EA6 and EA9. All applications must show Callsign, Date, Frequency, and Mode, and be in numerical order of EA district, and indicating the Province worked.

Send your application and a fee of five IRCs to URE, Vozalia de Diplomas, Box 220, Madrid 28080, Spain. This address applies to almost all applications.

Diploma 100 EA CW

This certificate may be earned by all licensed Amateurs. Operators from CQ Zones 1, 2, 3, 6, 7, 10, 12, 13, 19, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 38, 39 and 40 require 25 confirmed CW contacts, each earning four points to complete the 100 points necessary for the Award.

The URE will accept a certified list, in lieu of QSL cards, but reserves the right to call for and inspect cards if necessary.

Minimum requirements are to use at least three bands and seven EA districts, with stations worked once per band, and at least three days between contacts. The only exception to this rule is for stations worked during the EA DX CW contest.

Special trophies can be earned. Silver Medal for 500 contacts and Gold Medal for 1000 contacts. The fee for this award is also five IRCs. All contacts must have been made on or after 1st January, 1968.

Diploma CIA (Comunidad Iberoamericana)

All applicants must be licensed amateurs, operating within their licence category. This award can be earned for confirmed two-way contacts on CW and SSB on all HF bands, excluding WARC bands.

The award is issued in two categories, silver and gold. To obtain CIA Gold, work 20 IberoAmerican countries, plus Spain and Portugal. To obtain CIA Silver, work 15 IberoAmerican countries plus Spain and Portugal. The list of IberoAmerican countries includes Argentina, Bolivia,

Columbia, Costa Rica, Cuba, Chile, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Puerto Rico, Republic of Dominicana, Uruguay, Venezuela, and Brazil (plus Spain and Portugal).

URE will accept a certified list of contacts, in alphabetical order of countries, with the usual proviso regarding the authenticity of QSL cards. The fee is again five IRCs.

Diploma TPEA

Applicable to all licensed amateurs. It is valid for contacts after 1 March 1979, using SSB or CW. To earn the award, confirmed contacts must be made with ALL the Spanish Provinces, plus Ceuta and Melilla. A certified list of contacts will be accepted by URE. General rules apply. The following is a list of EA Provinces.

EA1: Asturias, Avila, Burgos, La Coruna, La Rioja, Leon, Lugo Orense, Palencia, Pontevedra, Salamanca, Santander, Segovia Soria, Valladolid, Zamora

EA2: Alava, Guipuzcoa, Huesca, Navarra, Teruel, Vizcaya, Zaragoza.

EA3: Barcelona, Gerona, Lerida, Tarragona.

EA4: Badajoz, Caceres, Ciudad Real, Cuenca, Guadalajara, Madrid, Toledo.

EA5: Albacete, Alicante, Castellon, Murcia, Valencia.

EA6: Balearic Islands.

EA7: Almeria, Cadiz, Cordoba, Granada, Huelva, Jaen, Malaga, and Sevilla.

EA8: Las Palmas (which includes the Islands of Gran Canaria Fuerteventura, Lanzarote, Graciosa and Alegranza).

Tenerife (which includes the Islands of Tenerife Gomera, La Palma and Hierro).

EA9: Ceuta and Melilla.

Diploma EA DX 100

This award is similar to DXCC, and follows the general rules which apply to the DXCC countries list plus GM Shetlands, JW Bear Island, IT Sicily, UN Karelia, and 4U1VIC Geneva. The one exception is EP Iran. The list must also include those countries which qualify for the WAE (Worked All Europe) award.

This award is issued for CW or SSB only, on any bands 160-10 metres, with no repeaters, satellite, or other special systems.

Endorsements will be given for each 50 countries up to 200, each 25 up to 300, and for each 1 above 300. The top DXers will appear in the Honour Roll list, published monthly in the URE magazine.

Julio EA4KR is QRV daily on 28550 kHz between 2200z and 0000z.

VK6 Division

Nearer to home, here is information from the West Australian Division of the WIA.

1. The Worked West Australian Shires Award.
2. The Worked West Australian Post Codes Award

To become eligible for these Awards it is necessary for Amateurs to work 40 Shires and 50 Post Codes, respectively.

Satisfactory evidence of contacts is required to obtain these Certificates. This information should be forwarded to The Contest Committee, c/o 1 Cottrill Street, Myaree WA 6154.

(Perhaps the above Committee would consider compiling a list of Shires to help those considering applying for above award)

VK DXCC Listings

Here now are the WIA DXCC Listings current as at 30th June 1994.

WIA DXCC STANDINGS PHONE Honour Roll

CALL SIGN	COUNTRIES
VK6LK	328/350
VK5MS	326/379
VK4KS	326/372
VK4LC	326/372
VK5WO	326/361
VK6HD	326/350
VK4RF	326/344
VK3QI	326/339
VK3AKK	326/336
VK3DYL	326/331

VK5QW	325/329
VK4UA	324/337
VK4OH	323/329
VK1ZL	322/327
VK2FGI	321/326
VK6RU	320/373
VK6NE	320/335
VK5XN	318/338
VK5EE	317/322
VK3OT	315/327
VK3YJ	315/320

General Listing

VK3AMK	313/329
VK3CSR	312/320

VK6AJW	312/317	VK2BQS	162/165	VK3DP	222/225	VK4AAR	303/306
VK7BC	310/319	VK4BAY	158/160	VK4DA	217/219	VK3DP	293/296
VK3RF	304/311	VK4AU	154/154	VK2CWS	210/212	VK2APK	292/328
VK6PY	304/309	7J1AAL	149/150	VK4DP	203/214	VK4BG	292/310
VK5WV	303/322	VK4ARB	149/150	VK4LV	200/207	VK2SG	289/314
VK3AWY	303/310	VK4DMP	147/148	VK4OD	179/182	VK2AKP	289/294
VK3WJ	303/308	VK3DNC	141/142	VK6PY	178/181	VK6RO	286/290
VK6VS	303/306	VK6LC	139/140	VK3CIM	173/174	VK3CYL	283/290
VK2WU	292/296	VK2SPS	135/137	VK5BO	159/184	VK4OD	279/282
VK3JI	290/304	VK4VJ	135/137	VK6MK	157/159	VK3VQ	270/287
VK4DP	289/300	VK6LG	135/135	VK3DNC	154/157	VK5BO	264/301
VK2AKP	289/294	VK2NO	128/	VK4XJ	150/163	VK3UY	263/265
VK2DTH	287/289	LU5EWO	125/	VK4UA	143/155	VK2ETM	239/240
VK4BG	286/301	SM6PRX	122/126	EA6AAK	138/	VK4XJ	233/249
VK2APK	285/313	VK7YP	122/124	VK7DQ	137/138	VK4CY	228/240
VK6RO	284/289	VK4LV	115/117	VK2SG	136/148	VK3CIM	224/225
VK3CYL	283/290	VK7WD	115/116	VK4KS	126/134	VK5UO	222/225
VK3DU	282/290	VK3BRZ	114/116	VK6BHW	124/126	VK4DA	218/220
VK5OU	281/286	VK4CY	112/	VK2TB	123/125	WA5VGI	216/218
VK4AAR	281/283	VK4NJQ	111/115	VK3AGW	119/120	VK2CWS	214/216
VK3VU	272/275	VK4VIS	108/110	VK2AKP	115/117	VK4LV	212/219
VK4OD	269/272	VK5AGM	105/107	VK5QJ	107/109	VK2VFT	202/205
VK3GI	261/264	N4JED	104/105	VK4ICU	104/	VK4ICU	189/191
ZS6IR	259/262	VK2EQ	104/	VK8KV	102/103	VK3DNC	185/187
VK3VQ	255/272	VK3EHP	103/105	VK2CXC	101/103	VK2BQS	176/179
VK2SG	253/274	VK4BJE	102/104	VK4CY	100/	PR7CPK	174/175
VK2AVZ	251/257	VK3YH	102/103	WIA DXCC STANDINGS			
VK4QO	251/255	JH3OHO	101/103	OPEN			
VK3DP	240/243	VK5ZH	100/104	Honour Roll			
VK2PU	237/240	VK2CMV	100/102	CALLSIGN COUNTRIES			
VK6YF	237/240	VK6APH	100/101	VK3YL	326/372	VK6LC	142/144
PS7AB	233/237	VK3TI	099/101	VK4KS	326/372	VK4NJQ	133/139
VK3DS	226/336	VK4KGE	099/101	VK5WO	326/364	VK4CHB	129/131
VK2ETM	226/227	WIA DXCC STANDINGS		VK4RF	326/361	YB8GH	127/129
VK2BCH	223/226	CW		VK8HD	326/351	VK4EZ	122/131
VK2CKW	222/225	Honour Roll		VK3QI	326/340	VK5BWW	111/112
VK5IE	219/221	CALLSIGN COUNTRIES		VK3AKK	326/337	VE7BS	106/107
VK5BO	218/222	VK3QI	324/335	VK5QW	325/329	VK3COR	102/104
VK1PS	211/212	VK6HD	323/343	VK4UA	324/339	SM7WF	101/
VK3UY	210/211	General Listing		VK3JA	321/367	VK7DS	099/102
VK4XJ	204/216	VK3XB	309/343	VK6RU	320/373	WIA DXCC STANDINGS	
VK3DD	200/204	VK4RF	306/332	VK3OT	318/330	RTTY	
ON6DP	200/202	VK3YL	301/340	VK7BC	317/325	General Listing	
VK4KRP	199/201	VK3KS	295/322	General Listing			
VK2VFT	198/201	VK5WO	295/310	VK3AMK	313/329	CALLSIGN COUNTRIES	
VK3DVT	196/198	VK2APK	274/304	VK3XB	311/340	VK3EBP	198/200
VK6BQN	186/190	VK6RU	273/317	WA3HUP	306/330	VK2SG	157/160
VK3CIM	179/182	VK3AKK	266/272	VK3JI	305/333	VK2BQS	115/117
KA1TFU	176/179	VK3JI	257/280	VK6PY	305/312	*PO Box 2175 Caulfield Junction 3181	
VK4DDJ	175/175	VK7BC	224/233	VK4DP	304/317	ar	
VK4ICU	168/170						

**Prevent pirates
— make sure
you sell your
transmitter to a
licensed amateur.**

WIA News
Space Symposium
The amateur satellite organisation, AMSAT, has scheduled 7 to 9 October for the AMSAT-NA Annual Meeting and Symposium, to be held in Orlando, Florida USA, notes the 15 June issue of *The ARRL Letter*.

AMSAT has been seeking papers for the symposium, even if the author is unable to attend. Papers covering the gamut of satellite activities are expected, including everything from tutorials through satellite operations to new applications and techniques. Inquiries to Steve Park WB9OEP, 12122 99th Ave North, Seminole FL 34642, USA.

Book Review

DXpeditioning Basics

Published by the International DX Association and the ARRL
Reviewed by Stephen Pall VK2PS

DXPEDITIONING BASICS



Wayne Mills N7NG

Have you ever had a dream that you were on a DXpedition on an island in the middle of the Pacific, on your own, and the pile-up was such that you could not handle it? Do you still remember pulling the "big switch" and waking up in a sweat?

Dream no more. To cure yourself from these real or imaginary nightmares, the remedy is to read the booklet "DXpeditioning Basics". Quite seriously now, this book should be mandatory reading material for every DXer. This 26 page, spiral bound book by Wayne Mills N7NG, a well known and experienced DXer who took part in the ZA1A, AH3C/KH5J, XF4L, 9M0S, V51Z and other DXpeditions, sets out quite clearly the guidelines under which any reputable and successful DXpedition should be conducted.

The topics discussed and the advice given is the result of the practical experiences of the author and other personalities. The booklet deals with DXpedition objectives and organisation, which areas of the globe to work, and when and on what bands. How to control the inevitable pile ups. How to handle the QSOs and how to overcome the frustrations of the DXers and the DX chasers. There are detailed observations about QSLing practices, ethics and other allied subjects. The author emphasises that "under no circumstances is it ever necessary to listen to more than 30 kHz on SSB and about 10 kHz on CW (in a split operation)". Further on he says that "frequencies should be selected according to the requirements dictated by the area of the world in which the operation is taking place". In another part

of the book we read that "the operation should take advantage of all openings to the target areas with all its resources".

The book identifies the DX target areas of the world for maximising the QSO rate. These areas are Europe, Asia (Japan) and the USA. We, here "down under", always suspected that, with our small numbered ratio of 13% of the world amateur population, we are at the tail end of the preferred areas for a DXpedition. However, to be fair, one has to admit that lately some DXpeditions are paying special attention to our needs by calling "VK/ZL/Pacific only".

This booklet is not only useful for prospective DXpeditioners but also for the "armchair" DXers. It will let you into the secrets of the operational mechanics and tactics of the DX stations and will assist you to be successful in "getting into the log".

Wayne Mills has produced a very useful read for the DX fraternity. The book is a joint publication by the International DX Association (INDEXA) and the American Radio Relay League (ARRL). Send your order with \$US5.00 (surface mail) or \$US10.00 (airmail) to INDEXA, PO Box 607, Rock Hill, SC 29731, USA.

ar

A. J & J COMAN ANTENNAS

Dual band Collinear 2M&70cm	\$ 95
2M collinear 2 5/8	\$ 93
5 ele 2M	\$ 73
12 ele 2M	\$115
6 M J-pole	\$109
6 M collinear 6dbd rad 4,NEW	\$149
6 ele 6M	\$188
Duo 10-15M	\$259
3 ele 15M	\$179
3 ele 20M	\$289
M B Vert NO TRAPS 10-80 M	\$249
Tri band beam HB 35 C 5 ele	\$665
30M linear loaded 2 ele	\$360
40M linear loaded 2 ele	\$449
13-30M logperiodic 12 ele	\$865
70 cm beam 12 ele bal/F	\$102
70 cm corner ref 11 to 15dbd	\$call
23 cm corner ref 13 to 17dbd	\$call
23 cm slot fed 34 ele brass	\$call
80 m top load/cap/hat vert.	\$280
3 ele 40m l/cap hats 60mm boom	\$770

PLUS FREIGHT AND PACKING

Bankcard Mastercard & Visa accepted

Call ANDY COMAN VK3WH

Lot 6, Websters Road, Clarkfield, 3429

Phone: (054) 285 134

DICK SMITH ELECTRONICS



Yaesu FT-530

Custom-Programmed For Australian Users

A deluxe 2m/70cm dual-band hand-held transceiver offering easier operation and more features than ever before! The FT-530 provides a flexible dual receiver facility with separate volume and squelch controls, allowing you to listen on two frequencies in the same band, or one frequency on both bands! Plus, the exclusive Australian version features full 70cm band coverage (420-450MHz), selectable Auto Repeater Shift on both 2m and 70cm (suits Australian band plan), and extended receiver coverage as standard. Two VFOs and 41 tunable memories per band are provided, together with keypad or dial frequency entry, seven tuning steps and a one-touch CALL channel. The dual 5.5-digit LCD screen includes many functional indicators plus separate signal/P.O. bargraphs for both receivers. An LCD voltmeter function is provided so you can even monitor your battery's performance under load and estimate remaining battery life.

Other top features include: Inbuilt dual CTCSS encode/decode, CTCSS scanning, an auto battery saver (ABS) for extended battery charge life, a cross-band repeater facility and inbuilt clock with alarm and snooze functions. Also provided is VOX circuitry for use with the optional YH-2 headset, a user replaceable lithium back-up battery, and DTMF selective calling and paging. A DC supply jack allows transceiver powering and NiCad charging, with RF output in four steps up to 5W at 12V. For enhanced battery life, an auto power-off function turns the radio off after a pre-set period of inactivity, so you won't return to a flat battery. The FT-530 comes complete with a high-capacity 1000mAh NiCad battery, belt-clip, carry case and approved AC charger.

Specifications

Frequency range:

Transmit	144-148MHz, 420-450MHz
Receive	130-174MHz, 420-500MHz, 800-950MHz

Current Consumption:

Auto power off	150uA
Standby (saver on)	18.8mA (both bands)

Dimensions: 56(W) x 163 (H) x 35mm(D)

Transmitter:

Power Output:	5, 3, 1.5, 0.5 (at 12V)
RF Power Output	2.0W (2m), 1.5W (70cm) (Supplied 7.2V 1000mAh NiCad)

Receiver:

Sensitivity:	2m: <0.15uV (Hem bands only, 70cm: <0.18uV
12dB SINAD)	
Audio Output (12V) 300mW at 8 ohms	

Cat D-3620

\$999

2 year warranty

MH-29A2B Remote Control Mic

A compact speaker/microphone that provides a remote LCD screen with backlighting! Has duplicate keys for Call channel, VFO and memory selection, plus busy/Tx LED. Supplied with a user-programmable key. Suits FT-530 only

Cat D-2119

\$199



Mobile Or Base, See Us First!

Yaesu FT-840 HF Transceiver

Blending the high-performance digital frequency-synthesis techniques of the FT-890 with the operating convenience of the FT-747GX which it replaces, the all new FT-840 HF mobile transceiver sets the new standard for high performance in affordable transceivers.

Covering all HF amateur bands from 160m-10m with 100w PEP output, and with continuous receiver coverage from 100kHz to 30MHz, the FT-840 provides SSB/CW/AM operation (FM optional), 100 memory channels, a large backlit LCD screen, two independent VFOs per band, an effective noise blanker and an uncluttered front panel, all in a compact case size of just 238 x 93 x 243mm (WHD).

Unlike some competing models, small size doesn't mean small facilities. The FT-840 provides easily accessible features such as: Variable mic. gain and RF power controls, SSB Speech processor for greater audio punch, and IF Shift plus CW Reverse to fight interference. Dual Direct Digital Synthesizers ensure clean transmitter output and fast Tx/Rx switching, while the low noise receiver front-end uses an active double-balanced mixer and selectable attenuator for improved strong signal handling. The FT-840 weighs just 4.5kg and uses a thermally-switched cooling fan, surface-mount components and a metal case for cool, reliable operation.

An extensive range of accessory items are available, including the FC-10 external automatic antenna tuner, so you can customise the FT-840 to suit your operating requirements.

Cat D-3275



\$1895

NEW FOR '94

2 Year Warranty



FT-2200 2m Mobile Transceiver

The new FT-2200 is a compact, fully featured 2m FM transceiver providing selectable power output of 5, 25 and 50 watts and includes the latest convenience features for more enjoyable mobile or base station operation. Built around a solid diecast chassis, it provides 49 tunable memories, a large variety of scanning modes, an instant recall CALL channel, 7 user-selectable channel steps from 5kHz to 50kHz and is just 140 x 40 x 160mm (not including knobs). Backlighting of the large LCD screen, knobs and major buttons is even automatically controlled to suit ambient light conditions.

Also provided is a 38 tone CTCSS encoder, DTMF based paging and selective calling with Auto-Page/Forwarding features, and 10 DTMF auto-dial memories. The LCD screen provides a highly legible bargraph Signal/F.O. meter plus indicators for the various paging and recording modes. An optional internal DVS-3 digital recording/playback board can also be controlled from the front panel giving even greater messaging flexibility. Supplied with an MH-2808 hand microphone, mobile mounting bracket and DC power lead.

Cat D-3635



\$699

NEW FOR '94

2 Year Warranty

FT-5200 2m/70cm Mobile Transceiver

The FT-5200 uses the latest innovations in compact cross-band full-duplex and detachable front-panel design for brilliant mobile performance. It has 32 tuneable memories, a built-in antenna duplexer, dual full-frequency LCD screen (with signal strength/power output bargraphs for each band), 8 level automatic display/button lighting dimmer and dual external speaker jacks (one for each band). A thermally-activated fan allows up to 50 watts output on the 2-meter band and 35 on the 70cm band. Plus, scanning features include programmable scan limits, selectable scan resume modes, memory skip, priority monitoring and one-touch recall CALL channels. In addition, 6 user-selectable channel steps are provided and a FRG-4 DTMF paging selfcall option lets you program a three-digit ID code so you can be paged by other transceivers, or page up to 5 other stations yourself. An optional YSK-1 remote panel lets you relocate the main ng (under the front seat, for example) and mount the control panel on the dash. The FT-5200 comes with hand mic, mobile mounting bracket and DC power lead.

Cat D-3310



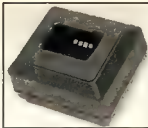
\$1499

2 Year Warranty

MasterCharger 1 Fast Desktop Charger

New for '94! At last, an intelligent, fast desktop charger that not only suits most current Yaesu handhelds but also many previous models. Made in USA, the MasterCharger 1 operates from 13.5V DC and uses switch mode technology plus a Philips battery charge monitor I.C. (with ΔV full charge detection) to charge NiCad batteries between 6V and 13.2V. Suitable for the FT-237, FT-411/411e, FT-470, FT-26, FT-415/815 and FT-530, its charging cradle can easily be replaced, allowing for the insertion of a new cradle to suit earlier Yaesu transceivers (eg FT-209R) or different brands/model handhelds. The MasterCharger 1 requires 12-15V DC at 1.3A, and is supplied with a fused cigarette lighter cable for vehicle use.

Cat D 3850
Now available - charging cradles to suit various Kenwood, Icom, and Alinco handhelds.



2m RF Power Amplifier

Boost your 2m hand-held's performance with this compact amplifier. Works with 0.3 to 5W input and provides up to 30W RF output, plus has an inbuilt GaAsFet receive pre-amp providng 12dB gain. A large heatsink and meta. casing allow for extended transmissions at full output, and a mobile mounting bracket is supplied for vehicle use. Requires 13.8V DC at 5A max. Size 100 x 36 x 175mm (W x H x D).
Cat D-2510



Revex W560N HF/VHF/ UHF SWR/PWR Meter

Another quality Revex wide band SWR meter, offering 2 inbuilt sensors for 1.8MHz to 525 MHz coverage! Provides measurement of 3 power levels (3W, 20W, 200W), SWR (at low and high power levels) and uses an N-type socket for the VHF/UHF sensor to ensure minimal loss. Measures 120 x 80 x 85mm

Limited Stocks
Cat D 1375

With PEP reading! HF/6m Power/SWR Meter

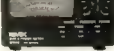
A quality wide-band SWR/power meter with accurate PEP metering. Manufactured in Japan, it's very well constructed with an all metal case. Features include a large backlit meter 1.8-60MHz coverage with less than 0.1dB insertion loss. 20W, 200W and 2KW power scales and LED indicators for Average/PEP operation. Requires 13.8VDC at 200mA.



Revex model W502
Cat D-1380

VHF/UHF Power/SWR Meter

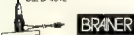
A high quality SWR/Power meter suitable for amateur, UHF CB and commercial applications. High quality Japanese construction assures you of maximum reliability. It has an all metal case, large meter display. 140-525MHz coverage with less than 0.3dB insertion loss and 4W, 20W & 200W power scales. Revex model W540.
Cat D-1370



2m/70cm Magnetic Mobile

The black TM-723M is a slimline Japanese dual-band mobile antenna supplied with a low-profile magnetic mount and low-loss coax cable. While only 0.7m high, it provides 1.7dB gain on 2m and 4.7dB gain on 70cm and has a conservative maximum power rating of 50W.

Cat D 4612



\$6995

2m/70cm Hi-Gain Mobile

The ST 7800 is our best long-range, dual-band mobile antenna providng high gain (4dB on 2m and 7.2dB on 70cm) while only 1.5m in length. It incorporates an inbuilt tilt over mechanism and has a max input power rating of 150 watts. Requires an SO-239 antenna base.
Cat D 4815



\$12995

PHONE, FAX & MAILORDER SERVICE & YAESU BROCHURE HOTLINE
Outside Sydney (FREE Call) 008 22 6610
Sydney and Enquiries - (02) 888 2105

Fax (02) 805 1966 or write to
Dick Smith Electronics, Mail Orders, Reply Paid 160
PO Box 321 NORTH RYDE NSW 2113
All major Credit Cards accepted. O/Nite Courier Available.
Yaesu stocks and some antennas not held at all stores; please contact your local store for availability, or phone 008 22 6610



B 1751

NSW - Albany 21 8399 - Bathurst 360 777 - Blacktown 671 7722 - Bondi 367 1444 - Brookvale 905 0441 - Burwood 744 7299 - Campbelltown 27 2199 - Chesham Chase 411 1855 - Chifley 942 8922 - Gore Hill 439 5311 - Gosford 25 0235 - Hornsby 477 6633 - Hurstville 580 8622 - Kogarah 56 2092 - Liverpool 600 9888 - Maitland 33 7866 - Mt City Centre 221 0060 - Miranda 525 2722 - Newcastle 61 1896 - North Sydney 938 3855 - North Sydney (Greenwood Plaza) 964 9457 - Orange 618 400 - Parramatta 589 2188 - Penrith 32 3400 - Railway Square 211 3777 - Sydney City 267 9111 - Taremont 66 1711 - Villalongue 28 3800 ACT - Belconnen (06) 253 1785 - Fishwick 260 4944 VIC - Ballarat 31 5433 - Bendigo 43 0388 - Box Hill 890 0699 - Casey 543 4444 - Dandenong 954 5377 - East Brighton 562 2386 - Essendon 879 7444 - Frankston 783 9144 - Geelong 232 7111 - Highpoint 318 6306 - Melbourne City 229 Elizabeth St 326 6089 & 746 Elizabeth St 310 0396 - Richmond 428 1614 - Ringwood 879 5338 - Sunshine 947 0522 QLD - Boonville 262 6204 - Brisbane City 229 5377 - Bundaberg 391 5233 - Cairns 311 515 - Capalaba 245 2870 - Cheltenham 359 4253 - Maroochydore 781 800 - Mordialloc 785 500 - Rockhampton 27 5644 - Southport 32 9033 - Townsville 38 4300 - Townsville 72 5722 - Underwood 341 0844 SA - Adelaide City 232 1200 - Elizabeth 255 6099 - Enfield 260 6088 - St Marys 277 8977 - West Lakes 735 1244 WA - Balclutha 240 1311 - Cannington 451 8666 - Fremantle 335 9733 - Perth City 481 3261 - Midland 250 1460 - Northbridge 328 6944 TAS - Glenorchy 732 176 - Hobart 31 0000 - Launceston 344 556 NT - Darwin 61 1977

NEW STORE OPEN AT Unit 2, Cnr Glibberd & Erindale Roads BALCATTA, WA. Ph: 240 1911
STORES ACROSS AUSTRALIA AND NEW ZEALAND

*MAJOR AMATEUR STOCKIST STORES SHOWN IN RED

Contests

P Nesbit VK3APN — Federal Contest Coordinator*

Contest Calendar Aug-Oct 94

Aug 5/7	YO DX Contest	(Jul 94)
Aug 13/14	Remembrance Day Contest	(Jul 94)
Aug 13/14	Worlded All Europe CW	(Jul 94)
Aug 20/21	SARTG RTTY Contest	
Aug 20/21	SEANET DX Contest Phone	(Jul 94)
Aug 20/21	15th Keyman's Club of Japan CW	(Jul 94)
Sep 3	Panama Anniversary Contest	
Sep 3/4	All Asia DX Contest Phone	(May 94)
Sep 4	Bugaran DX Contest	
Sep 10/11	Worked All Europe Phone	(Jul 94)
Sep 17/18	SAC DX CW	
Sep 24/25	SAC DX Phone	
Sep 24/25	CQ WW RTTY DX Contest	
Oct 1/2	VKZJ/Oceania DX Contest Phone	
Oct 2	RSGB 21/28 MHz Contest Phone	
Oct 8/9	VKZJ/Oceania DX Contest CW	
Oct 8/9	bercamenco Contest Phone	
Oct 15/16	Worked All Germany Contest Mixed	
Oct 16	RSGB 21/28 MHz Contest CW	
Oct 29/30	CQ WW DX Contest Phone	

In midwinter, at the low point of the sunspot cycle, it is tempting to dismiss conditions as being poor, and to put contesting on the backburner. That may be so for the higher frequency bands, but don't forget that good DX can still be found on the lower bands, with good openings (for instance) to South America. Many of us shy away from 40 m and below due to the higher noise levels and weaker signals, however, close listening often reveals good DX waiting to be worked. Although one has to work harder to make good scores, the fact that the openings are briefer than on 20 or 15 means that one can often put in quite a competitive effort, without necessarily wiping out the whole weekend as far as other activities are concerned. In addition, the new countries worked on the low bands never go amiss! So, why not take advantage of the lower QRN levels prevailing around this time of year, and see what you can do in one of the upcoming DX contests. You may be pleasantly surprised!

I had hoped to present the results of the recent John Moyle Field Day Contest this month, however, the floppy disk arrived scrambled, and there wasn't enough time to key in the accompanying printout. The results should appear next month. Whilst on the subject of floppy disks, it seems that the ordinary mail system may not be the safest way to send them, as out of about 50 disks (mainly 5-1/4") exchanged with contributors and others, about 10% appear to have become scrambled in transit! (I'm told that letters which fall near the edge of the conveyor belts, onto which

they are dumped for sorting, are exposed to magnetic fields from the motors driving the belts) If this is indeed the case, it appears that Australia Post has a significant problem to resolve if they don't want to lose business to private couriers! Have you had similar problems, and if so, do you know of a practical solution?

Thanks this month to VK1PJ, ZL1AAS, CQ, QST and Radio Communications. Until next month, good contesting!

Peter, VK3APN

Contest Details

The following details are supplemented by the "General Rules & Definitions" published in April 1993 *Amateur Radio*.

SARTG RTTY Contest

August 20/21, 0000-0800z & 1800-2400z Sat, 0800-1600z Sun.

This is the 24th annual contest sponsored by the Scandinavian Amateur Radio Teleprinter Group. Use 80-10 m; classes are single operator, single and multiband; multiplier single 7x SWL. Exchange RST and QSO number. Claim 5 points for QSOs with own country, 10 points for other countries on the same WAC continent, and 15 points for other WAC continents. Multiplier is total DXCC countries plus each call area in USA, VE/VO, and VK. Final score equals total QSO points (all bands) times total multiplier (all bands). Use a separate log for each band. Send logs and summary sheets to be received by 7 Oct to: SARTG Contest Manager, Bo Ohlsson SM4CMG, Skulsta 1258, S-710 41 Fellingsbro, Sweden

Panama Anniversary Contest

September 3, 0000-2400z Sat.

The Panama Radio Club invites all radio amateurs to participate in their 23rd annual contest. There is one category, single operator SSB. Use 40/20/15 m. Exchange RS plus serial number. Score 3 points for QSOs with HP club members, and 2 for non-members. Certificates of participation will be sent to all amateurs working 10 or more HP stations upon receipt of 3 IRCs. Send log postmarked by 30 November to "Radio Club Panama Contest, Box 10745, Panama 4, Panama".

Bulgarian DX CW Contest

September 4, 0000-2400z Sun.

This contest is organised by the Bulgarian Federation of Radio Amateurs,

and runs on the first Sunday of September each year on 80-10 m. Classes are: single operator, single and all band; multiplier single transmitter all band; SWL. Exchange RST plus ITU zone (P2 = 51, VK4/8 = 55, VK6 = 58, VK12/3/5/7 = 59). Score 6 points for each QSO with an LZ, 3 points for each QSO outside your WAC continent with a non-LZ, and 1 point for each QSO within your WAC continent. SWLs score 3 points if both exchange numbers are copied, and 1 point if only one exchange number is copied. Multiplier equals the total ITU zones worked on each band. The final score equals the total QSO points (all bands) times the total multiplier (all bands). Send logs postmarked by Oct 4 to: Central Radio Club, Box 830, 1000 Sofia, Bulgaria.

35th Scandinavian Activity Contest

September 17/18 (CW), September 24/25 (Phone); 1500z Sat — 1800z Sun.

The CW section of this contest runs on the 3rd full weekend of September each year, and phone one week later. The aim is to promote contacts between Scandinavian and non-Scandinavian amateurs on 80-10 m (no WARC bands). Scandinavian prefixes are: LA/LB/LG/LJ (Norway); JW; JX; OF/OG/ OH/OI (Finland); OH0 (Aland Isl); OH0M (Market Reef); OX; OY; OZ; SJ/SK/SL/ SM (Sweden); TF.

Categories (all band only) are: single operator; single operator QRP (max 10 W QRP); multiplier single transmitter; SWL. Exchange RS(T) plus serial starting at 001. For each QSO, non-European stations should score 1 point on 20, 15 and 10 m, and 3 points on 40 and 80 m. The multiplier is the number of call areas (0-9) for each Scandinavian country worked on each band. Portable stations without a district number count as area 0, eg G3XYZ/LA counts as LA0. OH0 and OH0M are separate call areas. The final score is total QSO points (all bands) times total multiplier (all bands).

Use standard format for logs and summary sheets. Show duplicate QSOs with 0 points. Dupe sheets are required for 200+ QSOs. Forward separate logs for CW and phone sections. Logs on DOS disk in lieu of paper are welcome. Summary sheet must be on paper. Disk logs must be in ASCII, 1 QSO per row. Include an SASE if you want your disk returned. Send logs postmarked by 31 Oct to: Liv Johansen LA4YW, NRRL HF Contest Manager, Box 142, N-7078 Saupstad, Norway. Comprehensive awards to top scoring stations.

CQ WW RTTY DX Contest

Sep 24/25, 0000z Sat — 2400z Sun.

This contest is jointly sponsored by CQ Magazine and the RTTY Journal. The object is to contact as many stations worldwide as possible, using Baudot, ASCII, AMTOR (FEC & ARQ), or Packet on 80-10 m (no unattended operation or operation through gateways or digipeaters).

Categories are: Single operator unassisted, single and multiband, Single operator assisted, all band, Multioperator single TX, all band ("10 minute" rule applies to this category EXCEPT that one — and only one — other band may be used during the 10 minute period, if — and only if — the station worked is a new multiplier); Multioperator multi TX, all band. Single operator entrants can enter the low power section (up to 150 W) or high power (more than 150 W). Single operator stations can operate 30 hours max. Rest periods must be at least 3 hours each, and the on and off periods must be clearly marked in the log. If single operator stations operate more than 30 hours, only the first 30 hours will count towards the official score. Multioperator stations may operate for the full 48 hours.

Stations may be contacted only once per band, regardless of the mode used. Send RST plus CQ zone; WVE will send RST, state or area, and CQ zone. Count 1 point for each QSO with stations in your own country, 2 points for each QSO outside your country but inside the same WAC continent, and 3 points for each QSO with stations outside your continent. On each band, the multiplier equals the sum of US states (max 48) and Canadian areas (max 13) PLUS DXCC countries (including W and VE) PLUS CQ zones (max 40). Note: KL7 and KH6 are claimable as country multipliers only, not state multipliers. Canadian areas are VO1, VO2, VE1 (NB), VE1 (NS), VE1 (PEI), VE2, VE3, VE4, VE5, VE6, VE7, VE8, VY. The final score equals total QSO points times total multiplier for all bands.

Submit a single summary sheet including scoring calculations for all bands, plus for each band a separate log, duplicate check list, and multiplier check sheet. Send logs postmarked by 1st December to: Roy Gould KT1N, CQ WW RTTY Contest Director, Box DX, Stow, MA 01775, USA. (Box "DX" is not a misprint!) A comprehensive range of plaques and certificates is offered.

Addendum to 1993 VK/ZL/Oceania DX Contest Results (May 94)

In the Single Operator Phone section, due to a spreadsheet hiccup V85BJ was shown scoring 1254 points on 160 m,

whereas this score should have appeared under 20 m.

In the Single Operator CW section, following further checking, VK2APK has been disqualified. Consequently, under "Top Single Operator CW scorer in each continent (Oceania)", change VK2APK to VK8AV.

1994 VK/ZL/OCEANIA DX CONTEST

When: This contest takes place each year on the 1st and 2nd full weekends of October (SSB and CW sections respectively). For 1994 the dates are: SSB: 1/2 October 1994,

1000 UTC Saturday to 1000 UTC Sunday
CW: 8/9 October 1994,

1000 UTC Saturday to 1000 UTC Sunday
Object: The object is for stations throughout the world to contact as many amateur stations in VK, ZL and Oceania as possible on 1.8-30 MHz (no WARC bands). The boundaries for Oceania are as for WARC.

Contacts between different countries in Oceania are permitted on all bands, (eg VK to ZL, ZL to SW, VK4 to VK9), but contacts within the same country in Oceania are permitted on 160 m and 80 m only (eg VK5 to VK6, ZL4 to ZL4, 3D2 to 3D2).

Categories: Single operator all band; single operator single band; multioperator all band; and SWL. Single operator stations are where one person performs all operating, logging, and spotting functions. The use of DX spotting nets will place the station in the multioperator category.

Exchange: RS(T) plus a 3 digit number starting at 001 and incrementing by 1 for each contact. If 1000 is reached, go to 4 digits.

Multiplier: On each band this is the number of prefixes worked on that band. A "prefix" is the letter/numerical combination forming either the first part of the callsign, or else the normal country identifier for stations using their home callsign in another DXCC country. For example: N8, W8, AG8, HG7, HG73 are all separate prefixes. The prefix for both N8ABC/KH9 and KH9/N8ABC is KH9. Portable designators without numbers are assumed to have zero after the letter prefix, eg N8ABC/PA becomes N8ABC/PA0. Any calls without numbers are assumed to have a zero after the first two letters, eg RAEM becomes RA0EM. Suffixes indicating maritime mobile, mobile, portable, alternate location, and licence class do not count as prefixes (eg IMM, IM, IP, IA, IE).

Scoring: For each contact score 20 points on 160 m; 10 points on 80 m; 5 points on 40 m; 1 point on 20 m; 2 points on 15 m;

and 3 points on 10 m. The final score will be the total QSO points multiplied by the total number of prefixes worked. The same prefix can be claimed on different bands.

Logs: Use a separate log for each band, with times in UTC. Show new prefix multipliers the first time they are worked. Logs should be checked for duplicates, correct points, and prefix multipliers. Logs must be accompanied by a sorted list of prefix multipliers, and a summary sheet showing callsign, name, address, category, score calculations, and a signed declaration that contest rules and radio regulations were observed. Logs may alternatively be submitted on DOS disk in ASCII format, although the summary sheet must be on paper. Please include any interesting anecdotes, and any comments on the contest are also invited.

SWL Logs: SWL logs should show date/time, the callsign of the station heard, the callsign of the station being worked, RS(T) and serial number sent by the heard station, points claimed, and new multipliers.

Log Submission: Send logs postmarked by 15 November 1994 (SSB) or 22 November 1994 (CW) to: John Litten ZL1AAS, NZART Contest Manager, 146 Sandspit Road, Howick 1705, NEW ZEALAND.

Overseas entrants please use airmail. Indicate SSB or CW on the envelope.

Awards: Special certificates will be awarded to the top scorers on SSB and CW in each category in each prefix area, and on each band for single band entries. Where returns justify, 2nd and 3rd place awards may also be made.

*PG Box 2175, Caulfield Junction. VIC 3161

**When you
buy something
from one of
our advertisers,
tell them you
read about it
in the WIA
Amateur Radio
Magazine.**

International Amateur Radio Union Monitoring Service (IARUMS) — Intruder Watch

Gordon Loveday VK4KAL*

For the last couple of months, band conditions have not been favourable above 20 metres. On the other hand, 40 metres is being heavily plundered by long term intruders. Many of these can be heard world wide and often feature in reports from other monitoring services.

In our region the ITU Radio Regulations state that the frequencies 7.000 to 7.100 MHz are reserved for exclusive use of the amateur service ONLY. One of the reasons we suffer from this type of interference problem is that amateur operators are permitted only a comparatively small amount of transmitting power. ALL of the intruders monitored use very powerful transmitters, the outputs being measured in kilowatts.

Many amateurs say why bother to report these intruders, as they have been

reported many times and are still there. Fair comment! BUT, the monitoring services of the world are constantly bringing these intrusions to the forefront in many international forums. This type of exposure does cause embarrassment to the governments controlling most of the intruders, and HAS resulted in the eventual removal of some from our bands.

We in the monitoring service have plenty of patience and will continue in the same manner. To maintain our pressure, however, we must have constant reports being sent in. PLEASE DON'T IGNORE INTRUDERS — REPORT THEM!!

Region 3 News

Another report of satellite intrusions has come from our man in Taipei, Paul

BV5OC. The band in question is 10 metres from 29.000 to 29.500 MHz. Indications are that the bulk of the intruders are from the south east coastal area of China. More reports are sought.

JARL (Japanese Amateur Radio League) monitors report that Vs are being heard frequently from 14.063 to 14.074 MHz. This is a common method to keep a frequency occupied. The origin of these transmissions is not known at present.

Military stations have been heard using F1b signals in the top part of 20 metres. These are easily identified by the use of the switching signal ZCZC at the commencement of a transmission. 14.340 MHz is where they have been active.

A few emission updates to conclude. "Piccolo" should be listed as J1BF, often as U1 (unidentified); and "Twinplex" as F1BCX. F1BCN covers SITOP. The Chinese have a 16 tone type on 14.255 MHz, J1BF.

*Federal Intruder Watch Co-Ordinator, Freepost No 4 Rubyvale QLD 4702 or VK4KAL@VK4JUN-1

Club Corner

Adelaide Hills Amateur Radio Society

The April 1994 meeting of the Adelaide Hills Amateur Radio Society was a special technical night where members displayed their home constructed "Z Match" Antenna Tuning Units. Of our 50 members, 23 presented some form of Z-Match, some units being made out of "junk" gleaned from our Annual Buy and Sell day, and others being from high quality commercial and ex surplus Defence components. The meeting was a great success.

Three well known Amateur Radio authors led the members into a spirited discussion, with LLOYD Butler VK5BR giving a talk on the evolution of this form of coupler and a demonstration of his latest experiments, ROB Gurr VK5RG presenting a simplistic and practical approach for a beginner to follow, and PHIL Williams VK5NN continuing with more practical hints from his vast experience. Other members gave brief discussions of their efforts, most giving credit to one or other of the above for their success with this ATU.

The Chairman of the AHARS is Geoff Taylor VK5TY who, together with a very active committee, leads one of the most popular Radio Clubs in South Australia, the program for which has a pleasant mix of amateur operating, technical and social meetings. The club meets at the

Blackwood High School, in the Adelaide Hills, at 7.30 pm on the third Thursday of each month. Details of the meetings are publicised on WIA Sunday morning broadcasts, and generally a call on the Adelaide Ch 7000 repeater will find at least one member listening, and able to assist at any time. Our weekly net on Ch 7000 at 8 pm local time each Monday night is supported by an average of 12

members. We usually have about 35 members and visitors attending our monthly meetings. Technical lectures delivered at our meetings are often video recorded, and played on the Adelaide ATV repeater on the Wednesday night following the meeting. Four AHARS members are also ATV enthusiasts.

ROB Gurr VK5RG
Public Officer



(l to r) Phil Williams VK5NN, Lloyd Butler VK5BR and Rob Gurr VK5RG admiring some of the home constructed "Z Match" tuners displayed at the April meeting of the AHARS.

South Coast Amateur Radio Club

2nd Annual South Australian Technical Symposium

The second annual South Australian Technical Symposium is to be held on Saturday, 17 September in Adelaide at the Onkaparinga Institute, O'Halloran Hill Campus (formerly the Kingston College of TAFE), Majors Road, O'Halloran Hill. This event presents a series of lectures on various technical aspects of amateur radio and the electronics and communications industries. Topics this year include:

Key Note Speakers:

How Cellular Mobile Phones Work
The Spectrum Management Agency

General Lectures:

FM ATV Equipment Construction and Operation
FAX and SSTV using your home PC
Electronic Test Equipment & Measurements
HF Antennas
HF QRP Operation & Equipment
EME Communications
The TPK Packet Radio Terminal
TCP/IP, The Internet and Amateur Packet Radio
An Introduction to Microprocessors

Telecom Australia
SMA Adelaide

David Minchin VK5KK
Colin McCarthy VK5EB
Mark Spooner VK5AWQ
Rob Gurr VK5RG
Bernie Samuel
Al Rechner VK5EK
Rod Baker VK5ZTV
Steve Fraser VK5ASF
Peter Cockburn VK5TZX

I hope to see you all in Adelaide on 17 September!

Grant Willis VK5ZWI

Philips World-wide QSO Party

All amateurs who are currently employed by, or retired from, the Philips Organisation are invited to take part in the 1994 QSO Party to be held, probably, during October or November. The QSO Party is similar to a normal contest where all modes of communication can be used. Any Philips personnel not aware of the existence of this contest and who would like to participate, should contact Ray Dobson, VK5DI @ VK5WI, QTHR in Calibook, or via Philips Components, PO Box 1, Alberton SA 5014.

Ray Dobson VK5DI

Moorabbin & District Radio Club

M&DRC runs a "happy hour" every Tuesday morning between 10 and 11 am. Visitors from the country and other states are always made welcome for a cup of coffee and a chat with 30 to 50 like minded people. They will also find the club's fully equipped station VK3APC and the club's museum well worth seeing. The location is the Combined Club Rooms, Turner Road, Highett, map reference 77-G-9

Allan Doble VK3AMD

BT

Divisional Notes

VK2 Notes

John Robinson VK2XY

By now, many of the Division's members will know the outcome of the opinion poll regarding the 1994 election, as suggested by the Division's barrister, Richard Parson, through our solicitors, Lewarne & Goldsmith.

The opinion poll, posted to all financial members in June, brought 752 replies, like the votes in the 1994 election, another record response. For the benefit of those members who haven't caught up with the results, broadcast via VK2WI on Sunday 10 July, the responses were as follows:

Those answering "yes" to Question 1, that they were satisfied with the election and supported an application to the appropriate court to have the Council ratified, numbered 551

Those answering "yes" to Question 2, that they were not satisfied with the election and requested an approach to the court to call another election, numbered 149

Those answering "yes" to Question 3, indicating they would oppose the court application and providing their name and address, numbered 15.

There were a total of 37 invalid responses. An overwhelming majority of responses received support the outcome of the Council election. Further developments are expected to be announced on Sunday broadcasts as they become known.

On a happier note, your scribe attended a packet meeting held at Nowra on Sunday 10 July. It was held to plan the future direction of packet development on the State's South Coast and to find immediate solution to packet congestion in the region. Members of many clubs within the region attended.

At the meeting, I advised those present of another generous donation of superseded equipment from Telecom. This was radio bearer equipment which particularly lends itself to solving packet network problems encountered by club members in this and other regions.

The equipment presently operates on the 900 MHz band and is most readily modified to operate on several existing amateur bands. It provides a baseband some 300 kHz wide and usually handles some 60 telephone channels. It has been observed that this system can be easily used to provide an inexpensive way to form a high speed packet "backbone" for many packet networks using various protocols. In addition, the equipment can also be used to provide the linking of separate voice repeaters, plus many other applications — all at the same time!

One future application suggested would be to provide a multiple channel voice link between capital cities and regional areas.

VK3 Notes

Jim Linton VK3PC

RD Contest Campaign to Win

Can Victoria win the contest again? Well, we're going to do our best on the weekend of August 13-14. In recent weeks

a number of groups, clubs and individuals have pledged their support. Some of these have featured in a series of reports on the weekly VK3BWL broadcast.

To win, Victoria needs to once again substantially boost the number of valid contest entries. The rules are simple, and were on pages 33 and 34 of last month's *Amateur Radio* magazine.

A word of warning! Don't be confused by the fact that two people have been named in the magazine as holding the title of RD Contest Coordinator. Only send your summary sheets and declarations to the new RD Contest Coordinator, A. Petkovic VK6APK, mentioned under point 15 in the rules.

New Council Appointments

The 1994-95 WIA Victoria Council held its first meeting on Saturday, 2 July. It resolved that officers currently serving in positions continue. They are President Jim Linton VK3PC, Secretary Barry Wilton VK3XV, Treasurer Rob Hailey VK3XLZ, Broadcast Coordinator George Hunt VK3ZNE, Alt Federal Councillor Bill Trigg VK3JTW, VTAC Coordinator Peter Mill VK3ZPP. The Council dealt with a busy agenda of corporate and financial matters, the acceptance of new members, and Federal WIA topics.

Special Projects Fund

The Council considered in-depth all of the submissions for funding received by the closing date of June 30. As previously announced by way of these notes, the VK3BWL Sunday broadcast, and elsewhere, some funding was made available for projects which were shown to be of benefit to members, and met a set criteria. The response to this initiative was disappointing in that it did not attract a wide range of submissions, and a variety of projects.

Nine initial inquiries were received from clubs and individuals. Each were sent a copy of the criteria. Council had four final submissions to consider, and each of the applicants has now received an individual written response.

A successful submission was made by the WIA Eastern Zone Amateur Radio Club, whose entire membership of 22 are WIA Victoria members. Council resolved to provide WIA EZARC equipment and financial assistance for its project which was well documented in the submission. The club has raised its own funding for a packet radio link between Gippsland and Melbourne, and needed additional assistance. The link, due to be completed in a few months, is set to be of considerable benefit.

Another project planned by the Twin Cities Radio and Electronics Club will also

receive part-funding for some equipment to be used on a packet facility.

Both of these projects provide network infrastructure for packet radio.

VK7M Notes

"QRM" Tasmanian Divisional

News

Robin L Harwood VK7RH

Charles VK7PP, who is the Divisional QSL Officer, recently reported that there had been difficulties in getting QSL routes to the Commonwealth of Independent States (CIS) following the break-up of the former Soviet Union. Several suggested routes appear from time to time, but the QSL bureau receives conflicting advice. Charles is working on obtaining a reliable route and correct information. Also, several calls have been noted from the former Yugoslavia and, if you work these, it is highly unlikely that you will get a QSL as there is no bureau covering the entire former nation. The legitimacy of some of these prefixes in so-called "liberated" areas is somewhat questionable. Some of these don't tally up with ITU prefixes.

The QSL Bureau has incoming cards for over 100 VK7s that haven't been collected yet. Some operators, we are aware, do not wish to QSL whilst others may not know what to do about using the VK7 Divisional Bureau. We recommend that you get in touch with the Bureau at

GPO Box 371D, Hobart TAS 7001 to ascertain if there are any outstanding cards held for your call. Also note that cards are forwarded to both the Northern and Northwest Branch for distribution in those areas.

Tony Bedelph VK7AX is the FTAC Coordinator for VK7. Tony, who is also the Divisional WIGEN Officer, can be reached at 5 Kywong Crescent, Ulverstone TAS 7315.

The Southern Branch Clubrooms on the Hobart Domain are on the former site of VIH Hobart Radio. To commemorate this historical link, the Branch has obtained the call of VK7OTC. It was the OTC who operated VIH until it closed down in February 1993. The station is activated every Wednesday afternoon between 12 noon and 5 pm when the Domain Centre is open. So pop in and have a chat. Visiting amateurs from interstate are most welcome.

Meetings for the month of August are: Southern Branch — Wednesday 3 August 2000 hours Domain Centre
Northwest Branch — Tuesday 11 August 1945 hours Penguin High School
Northern Branch — Wednesday 12 August 1930 hours Launceston Institute of TAFE, Alanvale Campus Block "C".

Don't forget to participate in the Remembrance Day Contest on 14 and 15 August and help the VK7 tally.

FTAC Notes

John Martin VK3KWA, Chairman, Federal Technical Advisory Committee*

13 cm Band Plan — "Final for the Time Being?"

I have received a number of comments on the draft band plans for 24 GHz published in the April and July issues of *Amateur Radio*. All agreed on the proposals for 2425 MHz and above. However, most felt that the 2424 MHz segment is too high in the band, and preferred an NB segment far closer to the satellite segment.

There were conflicting suggestions relating to the lower end of the band. The majority opinion seems to be that the lower ATV channel should be VSB only and that space should be found for a wideband data simplex segment.

The proposed plan was based on the assumption that the satellite segment should extend up to at least 2405 MHz, with flexibility for possible future expansion up to, say, 2410 MHz. But there is a new spanner in the works. The American FCC is now following the policy that the RF spectrum is a marketable

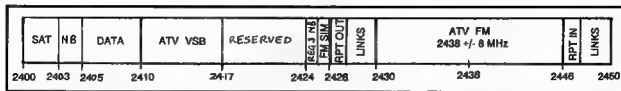
commodity, and has announced that it intends to sell off 2402-2417 MHz for commercial use.

This will make it virtually certain that any future satellites will operate only below 2402 MHz or above 2417 MHz. It would, therefore, be a good idea if our band plan kept some clear space above 2417 MHz in case it is required for future satellites.

So we come to "Plan C" as shown below. This plan takes into account the comments and suggestions received so far, and also the possible impact of the FCC's auction proposals on satellite allocations. I will wait until the end of August for any comments on this "Plan C". Unless there are any strong objections during that time I would then propose to adopt this plan as the "final as possible" version.

23 cm Band Plan

Responses on the 23 cm band plan have been received only from VK5 so far



Proposed Australian 2.4 GHz Band Plan.

I would appreciate hearing the views of all ATV and repeater groups. No major changes will be made until affected groups in all states have made their comments.

There is no objection to the proposed 1270 — 1271 MHz narrow band segment, with space for linear translators included within the 1270 and 1296 MHz NB segments, so it is proposed to write these into the band plan straight away. To avoid pre-empting other possible later changes, it is suggested that, for the time being, any new repeaters should operate only in the segment below 1282/1294 MHz. This will have effect on existing operation.

Please note also that, although some 1275 MHz radars have already closed, the 1270 — 1280 MHz radar guard band still applies until we hear otherwise and

amateur stations should continue to avoid transmitting there.

Illegal Use of 80 Metre DX Window

The 80 metre "DX window" is often overcrowded and there are problems with out of band operation and interference to other services. Use of frequencies around 3795 kHz LSB is very common but is no more legal than it would be to operate on 3500 kHz LSB. Some activity has been heard as low as 3792 kHz, and there is no excuse for this. Everyone should know the limits of the DX window and follow the rules.

The DX window is 3794-3800 kHz, with the proviso that amateur stations must not operate within 1 kHz of 3794 kHz. Therefore, no amateur signal should

extend below 3795 kHz. If you have a narrow filter (say 300-2500 Hz), using LSB with a suppressed carrier frequency of 3797.5 kHz would put you only just within the DX window, provided your frequency readout is spot on. Many radios have wider filters and would need more leeway than this.

Some radios have readouts which indicate the passband centre, and for LSB they normally display a frequency 1.5 kHz lower than the suppressed carrier frequency. This should be taken into account if you have this type of radio.

All this might seem pedantic, but the rules are clear and we break them at our own risk. A number of operators often use the DX window for local conversations. This is amazingly selfish and can only add to the problems.

**PO Box 2175, Caulfield Junction, VIC 3161*

Education Notes

Brenda Edmonds VK3KT*

For some time now I have commented on the need for a revision of the examination syllabuses, which have been in place for ten years. Well, at last, I have some action to report. With the considerable help of a small group of volunteers who have been working on the question bank review, the AOC/P/AOLCP syllabus has been reviewed and the NAACP review is under way.

It has been a very interesting exercise. Technology has advanced by quantum leaps in ten years, but not always in the directions which were predicted then. Those of you who have compared a modern HF transceiver with one from 1984 will agree. For example, the item "Appreciation of control functions on modern transceivers" could well take up about six weeks of class instruction, so we have tried as far as possible to define the bounds of such topics to help avoid the waste of class time.

There is always a tendency to add in a whole lot of "state of the art" technology, and to discard topics which seem to be outdated.

However, we decided not to make too

much radical change, and took care to remember that we were looking at an examination syllabus, not a text book on the latest marvels. Where a topic seemed to be out of date, we considered whether or not it might still be relevant to a newcomer using second hand equipment. In a few cases we deleted an item because of disagreement between the standard texts, or lack of suitable references.

Throughout the exercise, we kept in mind both the class instructor trying to work at a suitable level with a mixed group and the remote student trying to be self-sufficient. Hopefully, we have made the situation easier for both. We have also made the completion of the question banks a lot easier.

The section order has been changed, so that it now agrees with that in the NAACP, and there have been many small editorial changes.

Preliminary discussions with the SMA have clarified a few of our questions, and have led to a significant rewrite of the section on Interference. (Resolution of interference disputes will be an important

aspect of the new Regulations when they are released).

I hope to be able to present the final version to the SMA early in August, but I would be very pleased to receive further comments before then, particularly from persons experienced in running AOC/P classes or in writing examination questions. Copies of the draft have been sent to all Divisions, and should be available from them or from Divisional Education Officers. By the time you read this, the NAACP syllabus should also be in draft form. If any readers wish to comment on that, please feel free to contact me.

One final re-assurance! The syllabuses are not going to be changed overnight! I do not see the changes coming into effect for some time yet, probably not until after the question banks are finalised and approved. There will have to be a phasing-in period, and due consideration will be given to those who are being examined in the change-over period. I will keep you informed of progress.

**Federal Education Co-ordinator,
PO Box 445, Blackburn VIC 3130*

ar

How's DX

Stephen Pall VK2PS*

I have just listened to the recorded message of IPS Services, the Ionospheric Prediction Service here in Sydney. Have you ever phoned them before you sat down in front of your trusty rig to hear whether there is any activity on the bands? If not, please do it next time.

A recorded report on the state of the sun, the earth's magnetic field and the ionosphere is available by telephoning (02) 414 8330 at any time of the day. The contents of the message are updated at about 000 UTC (10 am Australian Eastern Standard Time) and more often at times of high solar, geomagnetic or ionospheric activity. The duration of the message is between 45 and 90 seconds, allowing you to obtain solar-geophysical information from anywhere within Australia at a very modest cost. The message is available on only one line. If this is engaged, you should try again.

The message will include the following details:-

- (a) The current status of IPS disturbance warnings, ie whether a warning is currently in operation
- (b) The current state of solar activity and the expected course of solar activity over the next day (or longer if possible)
- (c) The current state of the magnetic field and its expected behaviour in the next 24 hours
- (d) A report on ionospheric conditions in the Sydney area and a forecast of future conditions.
- (e) The Ottawa 10.7 cm solar radio flux for the previous day.
- (f) The estimated magnetic A index measured at Fredericksburg USA for the previous day.

So, what did the IPS Report predict for today? Solar activity is low. The T index is slightly rising. (Good! The higher the value of the T index, the higher are the ionospheric critical frequencies for today.) Geomagnetic activity is low and expected to remain low for the next 24 hours. The F2 layer is near the predicted values with some sporadic E layer activity. The 10.7 centimetre flux is 83 (it was in the 70s last week). The A index was 12 yesterday and the estimated value is 4 for today. (Again, good news! The higher bands should be open today and there is some possibility of activity on 10 metres. Let's go for it!)

Scarborough Reef — BS7H

On 24 April, Martti OH2BH/VR2BH and Claus DL5VJ surveyed, in a chartered plane, Scarborough Reef known to the

Chinese as Huang Yan Dao, Yellow Rock Island, situated in the South China Sea. The Reef (15° 07' N and 117° 51' E) lies more than 225 statute miles west from the Philippine mainland and is claimed by the Peoples Republic of China, despite the fact that it is located within the 200 mile economic zone of the Philippines.

The 45 minute aerial survey showed that at high tide there are several rocks or coral heads which are protruding from the water. Among these only two of them were of significant size. The rocks are estimated to be five by six feet with a height of approximately six feet above sea level.

Staying and operating from the solid soil of the reef is impossible at high tide. The only possible operating site would be one of the shipwrecks lying on the reef "which were well above sea level at the time of the survey", says Martti in his report.

This survey was followed by a mini-DXpedition organised by the Chinese Radio Sport Association (BYIPK) together with JA1BK and OH2BH, to the coral rocks on the weekend of 25-26 June. A party of eight amateurs, BZ1HAM, DL5VJ, DU1IOG, JA1IST, KJ4VH, OH2BH, OH2MAK and DU1RAA, in a 70 foot PNG (P29) oceanographic research vessel, the M/V Tabigaba under the command of an Australian, Captain Tony Hookway, with an Australian crew, arrived at the reef on 25 June at 0700 UTC. At about 0820 the DX activity started. In a very brief 12 hours of activity, about 2000 contacts were made, mostly with Japan and the USA. A handful of VKs (VK6RU and VK6UE were the first) were also successful in contacting the reef. The last contact was at 2258 UTC on 25 June.

One of the participants, JF1IST (of Okino-Torishima platform constructions fame) surveyed the rocks for drafting all the necessary plans for additional safety features and construction that may be needed for a full scale operation.

Prior to the activity, the special callign BS7H was issued by the PRC telecommunication authorities together with an official landing permit. An application has been sent to the DXAC for consideration of Scarborough Reef as a new DXCC country.

The DXAC is now in a very difficult, sensitive and delicate situation. Shall it recognise each of the Pratas and Scarborough operations? Both of them? Only one of them? Which one? Or none of them?

To QSL the BS7H activity, send your card with the usual SAE and return postage to W6CF, James A Maxwell, PO Box 473, Redwood Estates, CA 95044 — 0473, USA.

9X5HG — DK2SC

In the June 94 issue of *Amateur Radio* I expressed my hope that Hartmut, who was well known to the VKZL fraternity over the years as 9X5HG from Rwanda (see also page 32, October 1990 *Amateur Radio* and cover photo on February 1992 issue of *Amateur Radio*), has escaped from the civil war which is destroying that beautiful country.

After I made a number of enquiries in Germany, I was delighted to receive a long letter from Hartmut at the end of June from Germany. I am sure Hartmut will not mind sharing some of his experiences with you. To understand some of his references in his letter you must know that the German International Broadcaster "Die Deutsche Welle" had a relay station in Kigali where Hartmut was employed as a professional electronic engineer.

So let's read some parts of Hartmut's letter together.

"Let me report what happened after our last QSO in October 1993" writes Hartmut. "The life on Kinyinya Hill, 10 kilometres from Kigali was really some kind of a 'splendid isolation'. Whilst the local inhabitants down in the valley were cutting down the vegetation for firewood our German headquarters allowed us to build a stone wall around the 'Deutsche Welle' transmitter site. The big gardens around our bungalows under the expert fingers of Heidi, my XYL, were in full bloom. Even the trees were growing faster. Consequently my wire antennas moved higher and higher."

Later, an old 25 metre high guy-wire tower became redundant for the transmitting station. I got the tower and erected it in our garden. That was in December. My plan was to build more monoband log-periodics and put them all on the top of that tower.

In January my dream was over. A lot of aluminium piping was cut into pieces, for nothing! The transmitting station manager advised me to remove the tower. It was never explained to me why I should remove it, but I did.

Later on, as a result of a political agreement between the two Rwandan groups, the people who were fighting in the North against the Rwandan President were permitted to send some of their leaders into the Rwandan Parliament, along with 600 well trained and heavily armed Tutsi fighters to protect them. They lived half way between Kigali and our hill. Around their camp was a fence and on the outside were the blue-helmeted soldiers of Belgium, Bangladesh and Uruguay. This was a strange configuration. Heidi said



Pepl Z31PK, a member of the Macedonia DX Group, on contest location at 1700 m above sea level.

that we are now sitting on a "powderkeg". She was right when one considers what happened afterwards.

Two weeks before the plane carrying the Presidents of Rwanda and Burundi was shot down, Heidi and I travelled to Germany on our annual vacation, without thinking that we might not return. We followed the dramatic events as they unfolded in Rwanda on German television. All our personal belongings were in three aluminium boxes which were our travelling luggage. In one box was the little laptop computer that I am using now. Stored on the hard disk was a writing program and, luckily, the whole log of 9X5HG. (I used the laptop always as a back-up for the big computer in the shack.)

The very sad thing is that we lost all our belongings which were left in our bungalow in Kigali. We are almost certain that our house was broken into and our things were either stolen, destroyed or burned. Books from my father and grandfather, a collection of priceless china, one room full of "radio junk" collected over 45 years of hamming, my total QSL card collection, etc.

I am glad that we were not hurt. Life goes on and I concentrate on our future. We assume that the "Deutsche Welle" relay station in Kigali will be closed and we will never return there. I work now in our Cologne (Köln) headquarters. We live here in Köln in a tiny furnished apartment. I bought a little rig, the Scout, from Ten-Tec. Tomorrow I will connect it to a multiband vertical antenna on the balcony. There are no expectations regarding DXing, but perhaps I can reach some of

my old friends again. My greetings to all the DXers in your area. It was good fun to have always the relatively good conditions between Rwanda and Australia. Now I wish I would have been more active", says Hartmut ending his letter.

In some other parts of his letter Hartmut said that, if there is an amateur operator in VK (and I assume he also meant ZL) who still has not received a card from an 9X5HG contact, he will be glad to send a card to them. Please enclose a self addressed reply envelope, your QSL card and two US\$ "green stamps" or two IRCs for the return postage. His present address is Hartmut Gumpert, Gustav Heinemann Ufer 112, 50968, Köln, Germany.

EY — Tadzhikistan

Nodir EY8MM, formerly UJ8JMM, via N7RO provides the following information about amateur radio in Tadzhikistan as it appeared in the QRZ DX bulletin.

Tadzhikistan is divided into six call areas which do not correspond with the government administrative divisions. The number in brackets [] shows the number of operators in the call area.

EY1-3 Reserved to the Tadzhikistan Amateur Radio League.

EY4 Region of Gorniy (ex UJ-R) [1]

EY5 Region of Kulab City (Khatlonskaya Oblast, ex UJ-X) [2]

EY6 Region of Kurgan Tyube City (Khatlonskaya Oblast, ex UJ-X) [2]

EY7 Region of Khujant City (Leninabadskaya Oblasts, ex UJ-S) [27]

EY8 Capital Region (Dushanbe City, ex UJ-J) [28]

EY9 Region of Dushanbe City (Raiony Respublikanskogo Podchinnenia and Khatlonskaya Oblast, ex UJ-J and UJ-X) [4]

EY Reserved by the Tadzhikistan Amateur radio League.

Club callsigns have a suffix beginning with Z (EY-Z). There are four classes of licence. Third class 50 watts, Second class 100 watts, First class 200 watts and Extra class 200 watts (500 watts in a contest). Extra class operators may operate on the 160 and 80 metre bands. Tadzhikistan Amateur Radio League officers are, President EY8AA, Vice Presidents EY8MM and EY8CQ, and QSL Bureau Manager EY8WW. QSL cards for the EY and UJ stations should be sent via the TARTL QSL Bureau and not via Box 88 Moscow. The bureau's address is TARTL QSL Bureau, PO Box 303, Glavpochtamt, 734025, Dushanbe, Tadzhikistan, CIS. Note that they have not received any QSL cards from Box 88 in two years.

DXAC and DXCC News

The DX Advisory Committee decided not to reinstate the previously deleted Aldabra Reef to the DXCC list. In another decision the DXAC approved the call area guidelines. The DXAC guidelines call on DX stations to operate in a manner perceived to be fair and balanced to all areas and work portable stations in the specific call area they are listening for.

The DXCC Desk produced a long list of recently approved operations. The date in brackets is the date of the operations beginning. 3D2KR (25 Feb 94), 3D2LA (25 Feb 94), 3Y0PI (29 Jan 94), 5R8KH (21 Oct 93), 9N1BD (25 Aug 93), 9U5DX (8 Oct 93), A25/WDBNMV (15 Mar 93), E33RA (22 Nov 92), S21ZW (26 Oct 93), TU4EI (22 Sep 93), VP2EDK (23 Sep 93), XF4CI (15 Dec 93), XU9M (3 Mar 93), XU9R (3 Mar 93), ZF2CF (1 Mar 94), ZF2QA (21 Jan 91), 3D2MD (25 Jun 91), 3S2/ON4QM (24 Sept 90), 5W1JW (9 Sep 91), A35DM (8 Aug 90), C56/ON4QM (30 Oct 93), DP0RIM (count for 575) (13 Feb 93), H44QM (30 Oct 91), 9S2QM (16 Mar 92), T2OCB (9 Sep 92), Z3OMD (24 Sep 92), V63SB (24 Mar 94), V56/WA6TJM (2 June 92), XT2TX (19 Nov 93), YJ0AMD (1 Oct 90), ZK1DM (25 Sept 91), ZK2XX (29 Oct 93), ZK3DM (9 Aug 93).

Applications for DXCC and QSLs received at the DXCC Desk continue to run ahead of last year's rate. For the first five months of 1994, applications were up by 30% and QSL cards were up by 40%, compared to the same period last year.

Future DX Activity

- Jaime PP5LL will lead a DXpedition to Mel Island (OTA SA-47) from 2 to 16 September. Callsign to be used is ZZ5LL on the usual IOTA frequencies.

- QSL to PP5LL, Jaime Lira Do Valle, PO Box 8, 88010-970, Florianopolis, SC, Brazil.
- 9V1ARU will be active in September at the IARU Region 3 Conference to be held in Singapore
 - CN2VA will be active from 2 to 22 August QSL to IK4JQQ.
 - Watch out for ZS6IR on 80 m (3740-3800 kHz) and on 40 m (7045-7055 kHz) QSL to DL4JZ
 - ZD8OK will be active from Ascension Island for 6 months starting 1 August. Operator is GW0FJT QSL to N8ABW.
 - Tom LA4LN and Magne LB3RC will operate from Swalbard Island from 1 to 20 August as JW5LN and LB3RC/JW. QSL to the following correct addresses. JW5LN via LA4LN, Tom Victor Segalstad, PO Box 15, Kjelsas, N-0411, Oslo, Norway; and LB3RC/JW via LB3RC, Magne Nicolaysen, Ostgadesgt 23B, N-0474, Oslo 4, Norway.
 - Sanyu XU7VK is still active until Feb 1995. QSL to HA0HW.
 - 9L1MV will be active from Sierra Leone until 1996.
 - FR52Q/G on Glorioso Island will be active during July and August
 - Pavel OK2FUN is a member of the Czech embassy staff, and operates as SU1KR.
 - EX3Q/UA4FAQ, EX4Q/UA4FAY and EX7Q/R24FXT are active from Kyrgyzstan until 25 September. QSL to home calls.

Interesting QSOs and QSL information

- ZA1MH — Mike — 14250 — 0607 — May QSL to Mike Holman, PO Box 19, Tirana Albania.
- VR6DB — Dave — 14226 — SSB — 0550 — May QSL to Dave Brown, PO Box 13, Adamstown, Pitcairn Island via New Zealand
- KH3AP — Richard — 14226 — SSB — 0555 — May QSL to Richard Giles, Box 976, APO AP96558, USA.
- HR2BDC — Dean — 14226 — 0713 — June QSL to PO Box 2424, San Pedro Sula, Honduras
- YS1XS — Bill — 18127 — SSB — 0102 — June QSL to WD4PDZ, David L Purifoy Jr, PO Box 3437, New Bern, NC 28564 USA.
- TG9AOP — Oscar — 7205 SSB 0647 — June QSL to Box 1-1 Guatemala City 01907, Guatemala.
- XX9AS 14192 — SSB 1329 — June QSL to KU9C, Steven M Wheatley, PO Box 5953, Parsippany, NJ 07054 USA
- C53HG — Gary — 7205 — SSB — 0724 QSL to W3HCW, Carl F McDaniel 2116 Reed St, Williamsport, PA 17701 USA

- R0/UR8LV — Oleg — 14018 — CW — 1119 — June. QSL to Bureau or to PO Box 32, Dikson Island, 663241, Russia.
- NSJCL/CY9 — Scott — 14195 — SSB — 1129 — June. QSL to K0SN, Tom Hellem, W 6321 Two Mile Road, Portfield, WI 54159, USA.
- HA4NC — 3799 — SSB — 1145 — June. QSL to PO Box 168, Munda, New Georgia, Salomon Island.
- KH8BB — Noni — 3799 — SSB — 1146 — June. QSL to Noni Que, Box 5247, Pago Pago, AS 96799, American Samoa.
- 4K4POLA — 14023 — CW — 2011 — June. QSL to UAOKCL, Yuri Lobachev, Box 44, 686610, Pevak, Russia.
- 4L1AA — Omar — 7059 — SSB — 2101 — June. QSL to collecting point CT1CJJ, Jose Manuel Farto Lopes, Lugar da Igreja, Sao Martinho da Gandara, 320 Olivera de Azeimeis, Portugal (Note — direct only, no bureau cards)

From Here There and Everywhere

The well known "W6GO/K8HHD List of QSL Managers" which began in 1980 is no more. Well, not in the printed form, anyhow. The No 170, 17 June issue was the last newsprint edition. Jan and Jay "downsized" their business because family and health matters are demanding more of their time and they had to cut back to keep their heads above water. The "Go List", as it is known, will still be available on Packet cluster nodes, on floppy disks via mail and in the telephone modem download edition. In the future, instead of the monthly newsprint edition, an expanded QSL information column will appear in *The DX Magazine* published by Chod Harris VP2ML.

- Bill VK4CRR, the well known DXer, is planning a "YL" DXpedition to Cocos (Keeling) Islands, VK9C. He is looking for 4-6 experienced YL operators to spend 10 to 14 days on the island in September 94 or in April 1995. Bill says that all logistics and accommodation will be handled for the participants. For further details contact Bill Horner VK4CRR, 26 Iron St, Gympie, QLD 4570.
- Jack T30JH returned to Tarawa Atoll for a brief visit in the beginning of July and was heard on the 15, 20, 40 and 80 metre bands.
- According to Dave VR6DB, Pitcairn Island stations are now allowed to operate in the 12 and 17 metre bands.
- Japanese radio amateurs can use the following "windows" on the 80/75 metre band: 3500 — 3575 kHz, 3747 — 3754 kHz, and 3791 — 3805 kHz.
- If you have worked Aves island,

YW0RCV, send your QSL card to IARU Bureau via YV5AJ, YW0RCV, Radio Club Venezolano, PO Box 2285, Caracas, 1010-A, Venezuela with two IRCs and a SAE

- Do you have difficulty finding French QSL addresses in the International Callbook? Please note the following: The F5 + three letter suffix calls are the result of a new French call sign reassignment policy. Until an upgraded version of the callbook is published look for these suffixes under the following prefixes in the 1994 and earlier callbooks. F1, FC1, FD1, or FE1
- The Japanese airmail charges were increased in January. A "green stamp" is worth only 100 Yen. Send one IRC, worth 130 Yen, which is sufficient.
- If you still need a QSL card for the 1992 4J1FS activity, try again via OH3BU.
- KC4USB, a US Antarctic station, is active from time to time. If you want a card, send your card with the appropriate enclosures to Department of the Navy, Byrd Surface Camp, Antarctica, PO San Francisco, CA 96601 USA.
- JA3IG was active early in July from Christmas Island with a peculiar call sign. VK9IG QSL to his home call.
- Do not contact or QSL the following "stations": 7P8RQ, 7P8EQ, ZB2X, ZL9RV and 7T1BT. They are all suspected pirates. Save your time and money
- Argentine postage rates have increased. One "green stamp" is not adequate for return postage. One IRC is sufficient.
- DK0WCY is transmitting daily propagation forecasts on 3553 kHz, between 0600 and 0700 and from 1130 to 1600 UTC. It comprises a computer controlled 25 watt transmitter and a dipole antenna

QSLs Received

4L0JA (6W JP1BJR), 9V1YC (3W AA5BT), CR3W (6W DF5UL), PJ20H6XY (3M OH3GZ), RW0AJ (4M W3HNK), S21YD (1M SM6CST), TL8NG (2W WA1ECA), 5N0BHF (2W op), VR6CB (4M op), 9N1KY (5M op), Z31PK (3M op)

Thankyou

Many thanks to my contributors to this column. Your help is greatly appreciated. Special thanks to VK1FF, VK2BEX, VK2DEJ, VK2KCP, VK2KFU, VK4AAR, VK4CRR, VK6DX, DL2SC, PP5LL, and the following sources of information. *QZ DX*, *The DX Bulletin*, *The DX News Sheet*, *The W6GO/K8HHD QSL Managers list* and *IPS Radio and Space Services*

73 and Good DX

*PO Box 93, Dural NSW 2158

■

An Old Timer Reflects....

Des Greenham VK3CO looks back over 50 years of amateur radio operation.*

Recently, I went into a Dick Smiths store to buy a few odd bits to make a Morse Code oscillator and I got to thinking how easy it is now to make these things. Just a 555 chip and a few bits and away she goes! All so very easy. Just an odd piece of PCB, a few holes in the right place, a little soldering and the things works like a dream!

This set me thinking and reflecting on what it was like in the "good old days". We had no Dick Smith, only Homecrafts and Vealls in Swanston St. Here we could buy resistors, capacitors (condensers, in those days) and a valve, all at great expense. No disposal gear then.

Then we would go home and, after buying a sheet of aluminium, we would plan our project, be it a receiver, transmitter or just a Morse code practice oscillator. No kits then and only information from *QST* or *Amateur Radio* magazines. In 1939 we had a new magazine known as "*Radio & Hobbies*".

In our workshop we would bend the aluminium to the required shape to form our chassis. We then got our faithful socket punch and punched the holes for the valve sockets and other components. We then drilled the screw holes (no "Pop" rivets then). We fitted all the components and then came the wiring. This was point to point wiring and was done using "hook up" wire or tinned copper wire with "spaghetti" covering.

After many hours of laborious work the job was done. After a careful wiring check

then came the big moment — switch on! Either of two things happened. The thing just sat there and did nothing or there was a "bang" or "splat" and something got hot. Then another wiring check. Ah, yes. Here was a mistake, a component wired incorrectly. Not far out — only hooked to HT instead of earth !!

Remember that, in these times, ALL gear worked at high voltage. None of this soft 12 volts. The working voltage was at least 250 volts DC and 750 Volts AC — not to be taken lightly.

Then the switch on again. This time perhaps nothing! Then, with the trusty 1000 ohms/volt multimeter we would trace along the circuit to see what else was wrong. After a few corrections, we would try again to be greeted with an ear piercing squeal. Ah, this is good. Something is working with a bit of RF feedback. A few bypasses here and there and she is a "goer". Then the lineup and "on air" test; another story.

Yes, they were the "good old days" when we made our own gear and solved our own problems. Of course, we received lots of HT shocks and never really learned how NOT to get "boots". Through it all we made our gear and got it working and received that wonderful thrill of achievement when it worked.

Oh, well. Back to the 555 timer, a few bits and away she goes — dits and dahs.

Were the old days THAT good?

*16 Clydesdale Court, Mooroolbarn VIC 3629

Packet World

*Grant Willis VK5ZW**

Mail Forwarding

The amateur packet radio BBS network is able to handle many messages a day. Packet operators all over the world send and receive messages to each other via the system, but not many understand HOW the mail gets from point A to B. I am only going to consider personal traffic this month. Bulletins are a different case again.

When you lodge a personal message on your local BBS that is destined for a friend who uses another BBS station elsewhere, be it on the other side of the city or the other side of the world, you will always need to supply an ADDRESS of where that message has to go. A packet mail address can be thought of as similar to the postal address, albeit with different components to suite transport via computers. The BBS will take the message with its address, and make a decision on how to get the message one step closer to its destination.

Based on the address on the message, the BBS stations will pass it along the chain in a similar fashion to a bucket brigade. At each step in the chain, the BBS stations look at the address and decide which of their available neighbouring BBSs can pass the message one step closer to its destination. The links in the chain can be many and varied. Your message may start off on a 1200 baud VHF network, be transferred via a high speed 9600 baud link to a gateway station, who might then send it on HF packet to another more distant BBS. The next BBS may take the message via 6 m to another gateway via satellite (eg the UoSAT-22 Satellite Mail Gateway Network) or perhaps via an Internet Wormhole. This would continue until it reached its destination.

What does an address consist of? It has several parts:

(1) The Dest nation Callsign — who the message is being sent to.

(2) The Destination BBS Callsign — the BBS station where (1) will read the message from.

(3) The Location Address or Hierarchical Address — which gives information on where the BBS station is located which is used in choosing the path the message is sent along.

The address format looks like:

VK6ABC @ VK6XYZ #PER #WA AUS.OC
In this example, VK6ABC is the destination callsign, VK6XYZ is the destination BBS and the #PER.# WA AUS.OC part is the Hierarchical

Stolen Equipment

The following equipment has been reported stolen. If you have any information that may lead to the recovery of the equipment, please get in touch with the advised contact as soon as practicable.

Item: ICOM 720A HF Transceiver — serial No. 06619
GE 27 MHz 18 channel SSB CB rig
Home Brew ATU
5/8 wave 2 m whip antenna
1/4 wave 27 MHz whip antenna
Stolen from: Car
Where: Coolangatta, QLD
Date: 2/6/94
Reported to: Coolangatta Police
Owner: Alvin de Quincey
Callsign: VK7NDQ
Contact details: Bus 002 353 698
Home: 002 476 724

Address. This Hierarchical Address tells us that the BBS is located in Perth, which is located within Western Australia, which is located within Australia, which is located in the region known as Oceania. Use of these addresses by the BBS stations is what helps get the messages to their destinations. Finding out these addresses is sometimes the more difficult part, however!

To aid in this, originally the WORLI and MSYS packet BBS software programs started including a database system which extracted this address information called White Pages. Next month we will take a look at the White-Pages system, how it works and how to access its information. We will also look at how you can manually guess approximate addresses if you only know the BBS address.

paKet6 Released

The following news comes from Tony VK2DHU on the release of the new version of the paKet 6 terminal program.

It has been difficult to prepare this list of changes in paKet 6 because there has been continual change, development and refinement over the past two or more years since paKet 5 was released. However, a quick review of the paKet 5 Manual has helped me to produce the following brief summary of some of the changes.

The paKet manual is now 350 pages. The entire manual has been revised. While a few sections remain intact, most of the manual has been revised to cover the new version. The introductory section has been expanded too, and the Scripts Section has been fully rewritten in a tutorial format.

The PMS (Personal Message System) has been completely rewritten. It now includes Auto Forwarding to/from the BBS using the standard MBL/RLI conventions.

There are now 10 TNC Help Files included (for the following TNCs). DSP-12, KAM, KPC-3, MFJ-1278, PTC (PacComm PacTOR Controller), PK-232, PK-88, TNC-1, TNC-2, TNC-231 (release 2.31 firmware)

A new Online Configuration Help facility provides some additional information for the paKet operator while using paKet's Online Configuration. For each item in the configuration, a small window will pop up offering some help and suggestions for that item. This feature can be turned off if desired.

In addition to the Word Wrap that proved popular with paKet 5 and is now considered an essential feature of any communications software, paKet 6 now supports Justified Text as well. This provides an aligned right hand margin such as you see here in this paragraph.

This style is popular with some people and may be toggled on or off during a paKet session.

The Online Manual and TNC Help Files now load significantly faster, especially on an older, slower machine.

There is a Morse Code option in paKet 6 to uniquely identify different Alerts strings. So, if you are using the Alerts facility to alert you to the presence of a particular string of text and one of the specified strings is detected, paKet can make a unique sound to identify not only the fact that an Alert has occurred, but now it can identify WHICH alert string was detected! (Very useful if paKet is running as a background task under Windows or OS/2).

There has been a lot of attention to Scripts in paKet 6. There are several new Commands and the Scripts section of the manual has been completely rewritten in a tutorial format.

A new Quiet Mode is available at the touch of a key to silence all paKet sounds, including incoming beeps and warning bells.

paKet 6 includes a Serial Number Registration scheme so registered users can be readily identified. However, I am pleased to advise that there is no form of copy protection at all and unregistered users will still have access to the full paKet facilities while evaluating the software.

The Flashback Dump facility of paKet 5 has been further enhanced and now allows selective, partial dump of the Flashback Buffer.

There is improved support for Kantronics TNCs, including dual port operation.

There is a user programmable KISS OFF sequence to reset the TNC for normal operations after some other software has left the TNC in KISS Mode.

A new "Pass Control Codes" facility has been introduced especially to provide for more convenient transmission of Control Chars (eg <Ctrl-T>) which are often used in TCP/IP operations.

Keyboard Macros and Script texts now support substitution parameters (eg \$T for current time or \$D for today's date).

Message duration is now user configurable as some paKet users asked for longer display times and some asked for shorter times!

New keyboard commands:

<Alt-F3> to manually initiate a Forwarding session with our BBS.
<Alt-G> to get and redisplay the previous message that was displayed.
<Alt-Y> (yawn) to add a half second delay to various command texts such as Keyboard macros or Script command strings.

New Remote command that allows a

remote user to perform selected Scripts on your paKet system

Contest Mode has been removed in paKet 6. It appears very few people were using this mode and it was finally decided the overheads in memory and support effort were too much!

To obtain your copy, the new version is available to all registered users WITHOUT any additional registration fee. Yep, FREE. But if you want a disk in the mail please send \$5 to cover the costs of postage, diskette, etc.

For those not yet registered, paKet is still the same price as it has been since version 1.0 — it is \$25. And again an additional \$5 covers the mailing costs so it is \$30 for a disk in the mail

Mail Orders (with cheque/Money Order or details of Bankcard/Mastercard/VISA) may be sent to M A Lonsdale, 6 Marsden Cres, Port Macquarie NSW 2444.

The VK3 Packet Conference

Over the weekend of 4 and 5 June I was able to attend the VK3 Packet Conference in Ballarat. This event was run jointly by the Melbourne Packet Radio Group and the Ballarat Amateur Radio Group. The Saturday was the user information day where a series of talks was presented by people from MPRG on all aspects of packet operation. The day was well attended with about 20-30 people present and all went away hopefully with something new.

The Sunday session was for the packet BBS system operators and repeater groups. Various topics were covered including BBS header address standards, packet radio bandplan additions on 2 m and 70 cm, network management within VK3 and network growth and planned extensions. Network operational quality was also discussed by Lee VK3PK from the Geelong group, which led to the creation of a sysop mailing list to discuss the formalisation of some network standards. A report was also presented by each group represented on their activities and how they saw the network developing.

Overall the weekend was very useful and I would like to encourage more people to attend the next one which I believe will be held in Melbourne in December.

Conclusion

If you have anything you would like to see covered in the "Packet World" column, please either send your suggestions or contributions to me. I can be reached on packet at VK5ZWI@VK5TTY#ADL#SA.AUSOC or by post to GPO Box 1234 Adelaide 5001

© GPO Box 1234, Adelaide SA 5001

ar

Over to You — Members' Opinions

All letters from members will be considered for publication, but should be less than 300 words. The WIA accepts no responsibility for opinions expressed by correspondents.

Limited Licensees and 10 Metres

Reading G J McDonald's (VK2ZAB) opinions in the "Over to You" page in the July issue of *Amateur Radio*, I couldn't but help feel sympathy for that writer's approach to Limited licensees not being allowed access to 10 metres on all modes.

Perusing the 62 page Report To The Minister for May this year, regarding the discussion paper inquiring into the Apparatus licensing system, little is revealed about the Amateur Service.

The writer is currently updating to a Full or Combined Call and will probably go chasing DX on those HF bands other than 10 metres. Having said that, I hear some readers say, what's he on about?

A couple of relevant points. Firstly that 10 metres is STILL not being occupied by the fraternity. If you ask a ham if he uses the band, an awkward silence follows, then the usual remark that it's a good band when it's open but nobody uses it much, etc.

Secondly, if 29 MHz is granted to Limited licensees using FM only, the 28 MHz allocation will still sit there idle for the most part, just waiting for some outfit to make a bid.

Thirdly, VK2ZAB is correct when he states that FM on HF is not the real thing for a fair dinkum ham to cop! If the WIA needs members then there's a whole bunch of Limited calls waiting to sign up, given the right incentive.

The writer instructs in both levels of theory and is very much aware of the extra study the Full Theory students do to get their licence. The SMA should be alerted to this fact and urged to reward these people with 10 metres all modes.

Max Morris VK3YBE
PO Box 222
Rye VIC 3941

Stolen

While holidaying on the mainland with my family, all my radio equipment was stolen from my car. At the time of the theft my car was locked, with an alarm set, and was parked in a key controlled, supposedly SECURITY CAR PARK under our apartment block in Coolangatta.

We had just completed many thousands of kilometres up through the middle and across the east coast of Australia and had used the equipment, not only for day to day contact with friends in Tasmania (and many new and helpful friends on the 15 metre Travellers Net), but

also for emergency backup communication for other members of the family who had potential medical problems.

As you can imagine I was angered, depressed and a mixture of many other emotions for several days until it finally sank in that the equipment had really gone. The thief/thieves knew exactly what they wanted. The car was undamaged, the alarm turned off and nothing else touched except the obvious radio gear. They didn't even look under the seat where a 2 metre handheld had been left accidentally overnight.

Some of the equipment had strong personal value to me as I had owned it from brand new and some was generously loaned by my friend Maurice VK7SA. But what really angered me, apart from the time it took to mount all this gear in the car to survive the rigours of dirt and bitumen driving, apart from the days it took off our holiday seeing the police, insurance, etc, and apart from the all up cost to replace the equipment being over \$3,000 and I only had insurance to \$2,500, was the knowledge that the bloody quick sale of the gear would probably only net the thief/thieves around \$200 for the job.

Apart from the police being informed of the theft, I also reported the incident immediately to the 8:00 am, 2 metre net on the Gold Coast, where I received much appreciated sympathy and help in passing on equipment details and serial number to other amateurs in the area.

Lessons learned:

- Make sure you have itemised insurance that fully covers all your gear to replacement value and that your equipment is mounted in the vehicle to the insurer's specifications.
- If you wish to, or have to, leave your gear in the car then make sure that you have the most undefeatable alarm you can afford. It can be simple, but make it painful and impossible to switch off easily.
- Don't trust anything that says SECURITY!

Alan de Quincey VK7NDQ
154 Carella Street
Tranmere TAS 7018

Radio Australia

I read with interest your "WIA News" item in the July issue of *Amateur Radio* regarding the increased voice Radio Australia has acquired through the addition of two new transmitters at the

Cox Peninsula, Darwin site. I would, however, like to set the record straight on one seemingly popular misconception about the new facilities which, I note, has also been promulgated in other print media.

Your article is correct in that the two new units bring the total number of transmitters at the Cox Peninsula site to five, but it then goes on to effectively write off the other three. To the best of my knowledge, Senator Collins has no reason to fear that the original three transmitters which bear his name will be pensioned off for quite some time. In fact, given the normal lifespan that Australian Governments have traditionally come to expect from their transmission facilities, I suggest (with due respect to the good Senator) that the Collins name may well survive longer at Cox Peninsula than in Canberra.

As you might have gathered, I have rather a soft spot for the Collins 821 A-2 transmitters which, at the time of their installation (circa 1969), were very much state of the art devices — so much so that it took a very experienced team of engineers and technical officers several years to fully comprehend their operational idiosyncrasies and maintenance requirements. Regrettably, at the peak of the learning curve, and just when the Cox Peninsula station was becoming a powerful and stable part of the Radio Australia network, cyclone Tracy totally destroyed the antenna system and severely damaged much of the ancillary equipment, including the vital computer control facility.

The Collins transmitters themselves suffered only minor damage and some ten years later, after numerous inquiries, reports, and cabinet submissions, were restored to active service and have since carried a major share of Radio Australia's South East Asian and Chinese programs. The late Arthur Collins, as well as being head of a large manufacturing organisation, was a true pioneer and highly innovative engineer, as I'm sure those who were fortunate enough to own any Collins amateur radio equipment will agree. When he decided to bid for the Darwin transmitter contract in the early sixties, he virtually locked his design staff in a room with instructions to produce a tunable 250 kW HF power amplifier which did not use the normal lumped circuit elements (which he considered totally inefficient), and was capable of being linearly modulated to one hundred and ten percent. He suggested that they should adapt those techniques which had already been proven in VHF and UHF transmitters.

In the final prototype large rectangular

cavities with servo driven shorting planes replaced the normal tank circuit, output coupling and balun inductors and, when these were resonated with proportionately large vacuum variable capacitors, the desired very high Q tuned circuits were achieved. Despite the inertia of these rather massive mechanical components the transmitter could be retuned from one end of the HF spectrum to the other (6 to 26 MHz) fully automatically in a matter of twelve seconds or less — a task which, with the existing transmitters of the day, occupied two or three experienced technical officers for up to twenty minutes.

Much of the servo control and automation technology was adapted from recent developments in the aero-space industry in which Collins was also heavily involved. The sole interface with the transmitter was via the keyboard of a teletype machine and all log keeping, fault reporting and diagnostic routines were output through the same medium.

There were only eight Collins 821A-2 transmitters ever commissioned, the other five being installed at Sackville, Canada where they have operated continuously since about 1970. As an example of lateral thinking and innovation they stand alone in the past half century of transmitter development and, I'm sure, will not be replaced while ever they are capable of performing the service for which they were designed.

Max Chadwick VK3WT
15 Norray Avenue
Mount Waverley VIC 3149

VI Prefix

I cannot agree with the proposal on page two of *July Amateur Radio* to grant visitors the "VI" prefix; it is ironic that it appeared in juxtaposition to the item on page 14 explaining the use of the AX/VI prefixes.

In the past, amateurs have been allowed to use VI instead of AX. What would happen if VK2USA (listed in the Call Book) were to ask for a VI prefix, only to find that it had been allocated to some visiting American?

What, exactly, was wrong with allocating the hitherto-unused "H" suffixes, or "O", or (heaven forbid!) the "Q" suffix, does anyone seriously believe that (say) VK2QXX will be confused with the Q-code, now that we are no longer using spark-gap technology?

David I Horsfall VK2KFU/VK2ZTB
PO Box 257
Wahroonga NSW 2076

FM is Not Real Amateur Radio!

I note with interest Gordon McDonald VK2ZAB's comments in *July Amateur Radio* that "FM is not real amateur radio",

and wonder what he meant. Surely he did not mean that, because other services use such a mode, we shouldn't because, in some way, we should be above that? After all, we amateurs pioneered the use of every mode I can think of. I cannot understand why Gordon would seek to denigrate those pioneers who have gone before us both.

In reference to his comments about extra privileges for Limited licensees. At the time of the review, I was VK4 Alternate Federal Councillor and was present at the quarterly Council meeting at which the WIA's position on the Review of Licence Conditions was discussed in great detail. A total of 41 submissions were received from the 18,000 plus amateurs in Australia, and only two went to a second page. Did VK2ZAB send one in? My own submission covered all aspects of the licensing grades, privileges, operating conditions, modes, power and so on and went to seven pages of detail. Many of the points I made were included in the WIA's discussions with the Department.

It should be recognised that the WIA does not establish a pre-determined position of intransigence, as bully-boy tactics on the part of either party are never as productive as meaningful discussions based on mutual satisfaction. As Gordon notes, our use is concerned with the quality of life. The amateur bands are like the national parks of the radio spectrum

and we are like the naturalist conservationists. The WIA enters all discussions with the SMA from that perspective, coupled with our great technical base.

The aspect of Limited licensees being given access to 10 metres FM was included in my paper and is a logical extension of the technical areas of experimentation which lies with all amateurs, not just Limited licensees. Its major benefit is to increase the population base in the FM segment of the band, since Novices keep the bottom segment very active.

The whole 10 metre band is under threat from pirate commercial interests. This was seen as a way to populate the band, to give the Limited licensee a further taste of DX and, hopefully, to give that bit of extra incentive to upgrade his/her licence. Note that all privileges and band structures use this "incentive concept" as a way to keep us on our toes.

Gordon, I hope this sets your mind at ease and you now recognise that it was NOT the Department which instigated this proposal, but was indeed the WIA. Give us the chance and we will DO IT PROPERLY.

David Jones VK4OF
18 Browning Ct
Strathpine QLD 4500
ar

Pounding Brass

Stephen P Smith VK2SPS*

It is hoped you reaped the benefits from the last two issues of *Pounding Brass* covering "Morse Practice Nets". Whether you are a newcomer to the ranks of amateur radio, or already hold a licence and intend to upgrade in the near future, I am sure you would have found something for your particular level that would have assisted you to increase your Morse receiving capabilities. In this day and age we all take things for granted, spending modest amounts of money on equipment for the shack, etc. We can tune into Morse transmissions virtually day or night, whether it is nets or DX, allowing us to improve our receiving abilities. Some people have the technical knowledge and can home brew a simple DC receiver and thus copy Morse.

Just take a minute to think about people who, due to circumstances, have no equipment or technical knowledge. How can they learn Morse and be expected to pass the required examinations? You may be fortunate and belong to a club, thus receiving the required training from the

more experienced operators, or be lucky enough to borrow a receiver. You could obtain the required books on Morse, learn the alphabet, numbers, etc and then sit the exam. We all know the outcome, the big "F". Remember, Morse is learnt by sound and I emphasise "Sound". You have to train your brain to read the letters by their "sound equivalent" and not as "dots and dashes".

Which brings me to the topic for this issue, the humble "Morse Cassette". I hope to guide you through the more reputable brands which are currently on the market. To give you an idea of what's around we have the following sources. WIA, RSGB, ARRL, Dick Smith, Gordon West Radio School, W5YI tapes, Kawa Records, 73 code, and the list goes on and on. With so many varieties of Morse tapes, how is the beginner going to make the right choice? Some of the most asked questions from a beginner are:

- How many tapes do I require to pass my exam?
- Am I getting value for money?

(c) Will I benefit from it?

All valid points. Answers are as follows:

(a) Being individuals we all learn at different rates, some people can pick things up faster than others. With the Morse cassettes it takes a minimum of six to completely learn the code without any additional "outside" practice. Some people may need more, some less.

(b) Cassettes are cheap at \$2.50 — \$5.00 a cassette, or more if supplemented with a theory text book. Imported cassettes will cost you a lot more than stated above. You would be far better off purchasing your cassettes through your particular radio society where you are guaranteed a high standard type cassette.

(c) "Yes, you will benefit" as you are learning by sound. Remember, short and consistent practice lessons are the key.

Note, however, that with all Morse tapes, regardless of speed, a point will be reached in your training when you subconsciously memorise the code practice exercise thus giving you a false sense of security of having learned the code at the specific speed. When this happens, or your copy of the exercise is around 85% or more each time you play your cassette, it's time to either:

(a) Change to a new cassette with a different exercise, or

(b) Increase the speed of the Morse cassette. If you don't, you will become static and further training will be of limited benefit to you.

When your copy is 85% or more, as mentioned above, double the speed of your cassette. I would advise this instead of going on to another cassette of the same speed.

If you do decide to increase your speed and you can only manage 10% or less of the exercise, don't despair! This is quite normal, your brain is going through a transitional period adjusting itself to the faster speed. This might sound extreme, but you will be surprised at how quickly your receiving ability is greatly increased.

We will now have a look at the "Novice Study Kit". This kit is available through Dick Smith Electronics stores Australia wide. The kit consists of a C60 minute Morse cassette along with a theory text book. Recommended price \$19.95.

The cassette is produced by Graeme VK2KE (ex VK3ZFR) who has been making Morse tapes since the 70s. Taking a close look at the contents of the tape, it starts with an introduction from Graeme looking at Morse code in this day and age, the structure of the course, and how you can approach the exercises for maximum benefit. At the completion of the introduction, Graeme starts with the alphabet by saying the letter first, followed by the Morse equivalent of that letter sent

three times by computer. He then reconfirms the letter again in English. Graeme follows these guide lines throughout the alphabet and then continues with numbers through to 9. A number of groups are then sent with each group consisting of 50 — 65 characters sent in random order. Group 1 consists of the letters E T M A N I, group 2 of R D U C S O, group 3 of K P B G W F, and group 4 of Q H L Y. At the end of each group, Graeme reads back what was sent so that any mistakes can be corrected.

Side 2 of the cassette continues with group 5 finalising the alphabet with the letters J X V Z, group 6 consisting of numbers only, and groups 7 and 9 being random letters of the alphabet. Group 8 is a trial Novice Exam with numbers, with the last few moments of the tape consisting of alphanumeric code groups. This tape is an introduction to Morse for the complete beginner. Once mastered you can move onto other Morse tapes or nets that will assist you in obtaining the required speed for your Morse exams.

Graeme has not changed the price of his cassettes in over twenty years. He is still selling C60s (1 hr tapes) for \$5 each. Some of the tapes that are available include the abovementioned Beginners Course, 5 wpm sample exams, 10-15 wpm sample exams and tapes at 20 wpm. For further information, you can contact Graeme through his VK2KE Call Book address.

We will now move along and have a look at the ARRL Morse Course. This course was produced by Larry WA3VIL, Bruce KB1MW and Kathy N1GZO. The course is computer generated as are the majority of the tapes produced today. There are four sets of tapes available, each set consisting of two 90 minute cassettes ranging in various speeds. (1) 5-10 wpm (2) 10-15 wpm (3) 15-22 wpm and (4) 13-14 wpm. Each set also includes a 14 page guide outlining the required

Morse exercises, and is contained in a neatly packaged thick blue plastic type booklet giving the cassettes good protection. The above sets are available through the WIA at \$16.00 per set or, if you are a member, \$14.40. So, it makes sense to be a member of the WIA. These cassettes can also be purchased from Daycom in Victoria at \$18.50 per set. Further enquires can be made on 03 543 6444. You should also be advised this course doesn't cater for the beginner. I have yet to see a beginners course from the ARRL in VK.

I believe you should have had some Morse training before attempting set (1) above. Let's have a look at how the course is structured. Most cassette courses on the market today follow a similar pattern in that the Morse is sent in random groups, alphanumeric along with short paragraphs covering virtually any subject. Note, however, the Morse in the ARRL course is about 75% QSO format. Candidates in Britain are now tested using QSO style examinations with greater emphasis on the use of pro-words and Q code, etc. This actually gives the student an idea of what to expect when he/she makes that first CQ call.

Speed wise the tapes are broken down as:

Tape (1) Side A 5-5.8 wpm; Side B 6.7-7.5 wpm

Tape (2) Side A 8-8.7 wpm; Side B 9.3-10 wpm

As the speed slowly increases, so does the difficulty of the Morse transmissions. This is a well thought out course and is certainly good value for money. Sets 2 through to 4 follow the same guide lines except at a faster speed.

Next month we will look at the WIA course as well as the rules for the QRP EU Contest

*PO Box 351 Mona Vale NSW 2103

8

**This space could be
earning you money!
Advertising rates
available from
PO Box 2175, Caulfield
Junction, Vic., 3161**

Repeater Link

Will McGhie VK6UU*

For a change this month, no FM 828 circuit diagram. There are two circuits to go, the RF power amplifier and the mic amplifier. Both these circuits are drawn and available, so if you need them now, contact me and I can send them to you in the mail as hard copy or computer disk, or via Packet radio.

Pager Notch Filter

The accompanying drawing shows a full size cavity filter frequency response when used as a parallel notch filter. It is primarily intended to be used in a repeater receiver that is being overloaded by pager transmissions. As you can see from the drawing, a repeater receiver with an input as close as 200 kHz from a pager transmission, can have the pager transmission reduced by more than 20 dB, with 2 dB of loss on the receive

frequency. If your repeater receiver is more than 300 kHz away from the pager transmission there is almost no loss on the receive frequency.

The cavity filter is "T"ed into the coax feed to the repeater's receiver and only one of the coupling loops is used in the cavity filter. The notch can, of course, be tuned up or down to notch out the main pager problem. The 148.050 MHz in the drawing is an example showing just how close the notch can be placed for pagers that are very close to 148 MHz.

The improvement can be dramatic; from unusable, to no pager overload at all. I suffered vast amounts of pager overload on a receiver used for monitoring to the point where there was no way any sense could be made out of the 2 metre band. The receiver mute was opening almost continuously and the receiver had to be turned off. With the cavity notch filter in there is no pager overload.

The notch depth varied a little between cavity filters, perhaps due to different amounts of coupling in each filter, but

averaged 20 dB. Note the non symmetrical response of the notch. If pagers were on the low side of 2 metres extra loss would be incurred to the received signal, but for once a win

29 MHz FM

At long last VK6 has a 29 MHz gateway to one of our 2 metre repeaters, VK6RLM. It is an idea that I have mentioned in *Repeater Link* before. Connect a 29 MHz simplex input output onto an existing repeater. This opens up for the repeater users the potential to work other stations on 29 MHz over large distances.

The advantage of a simplex gateway, rather than a 29 MHz repeater with different input output frequencies connected to an existing 2 metre or 70 cm repeater, is considerable. The 29 MHz equipment is simpler and easier to put on air. There are no desensitising problems on 29 MHz, a big plus. However, the greatest benefit, I believe, and time may prove me wrong, is the ability to link up any number of these systems around the world, depending on propagation. Something that can not be done easily, if at all, with 29 MHz repeaters. Any existing VHF or UHF repeater connected to a 29 MHz simplex system, that is on the same frequency as another 29 MHz system connected to a VHF or UHF repeater, links the repeaters together.

At the moment there are three 29 MHz simplex gateway stations in Australia. The first on air was VK2RVW Wollongong, linked to two 70 cm repeaters, followed by VK4RLB linked to a six metre repeater, and now VK6RLM Perth. The term "linked" may be confusing as the 29 MHz equipment is co-sited with the VHF or UHF repeater and hard wired into the existing repeater.

There has already been a link up between the VK2 gateway and the VK4 gateway with amateurs talking on 70 cm in VK2 to amateurs on six metres in VK4. Amateurs in VK6 on 2 metres have also talked to amateurs in VK2 on 70 cm noise free.

There may or may not be a licensing problem with retransmitting all grades of licence onto 29 MHz. The systems in VK2 and VK4 are open access and transmit all stations onto 29 MHz that use the local repeater. The system in VK6 (and this may change) requires a CTCSS tone of 88.5 Hz on the amateur transmission on 2 metres to activate the 29 MHz re-transmission. All gateways are open access on 29 MHz.

The choice of 29.040 MHz was made because it has been, up to now, a quiet frequency. If you think your repeater could benefit from such a gateway and require any extra information, please let me know.

*21 Waterloo Cr Lismurdie 6076 VK6UU @ VK6BBS

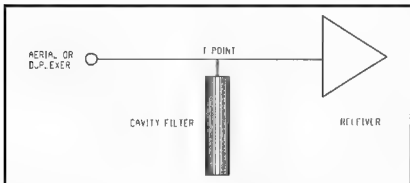


Fig 1.

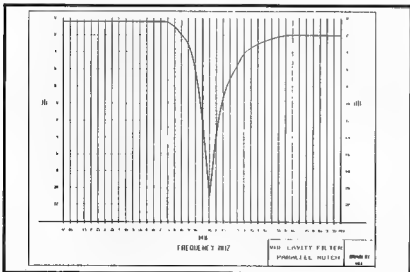



Fig 2.

QSLs from the WIA Collection

Ken Matchett VK3TL* Honorary Curator WIA QSL Collection





3G9SBV

REPUBLICA DE CHILE

DECEPCION ISLAND Lat 63° 01' S. Long 60° 38' W

CONFIRMING QSO W/IN		DATE		UTC	MHz	RST	2-WAY
QSO	W/IN	DAY	MONTH				
VK2	BCH	18	DEC	26	0856	J4	59
						SSB	

No 0258



VI2AUS
SYDNEY AUSTRALIA
 FIRST NON-STOP CROSSING OF AUSTRALIA

Thanks

The WIA would like to thank the following for their kind contribution of QSL cards to the Collection (supplementary list).

Jim VK9NS, Arnold VK3AGW, Mike VK6HD, Ossie VK3AHK, Marilyn VK3DMS, Peter VK4NJQ, Andy VK4KYM, Terry VK2ALG, Ron VK4NRZ, Geoff VK2POA, Shiela G3HCQ, Roth VK3BG, Tom VK5TL, Stan VK3TE, Al W2MEL,

Terry VK2ALG (Australian Naval Amateur Radio Society), Henry VK4OX, "Bing" VK2BCH, Tom VK2QT, Barry VK5BS, Andy VK3BEL, Owen VK1CC, Nev VK2QF, Murray VK4KX, WIA Central Qld Branch V14MOO.

Also the friends and relatives of the following "Silent Keys" (supplementary list):

Col Chirnside VK3WQ, Jeff Whyte VK2AHM (courtesy Marilyn VK3DMS), Bill Wallace VK4KHZ, Bob Smith VK3YU,

Norm Cameron VK3NC, Joe Boell VK3AIF, Lindsay West VK2EI.

Note from the Author

The collection is still in need of QSL cards. Those most in demand are rare DX cards, pre-war, pictorial and thematic cards and special issue (commemorative) QSLs. Please contact the author.

*4 Sunrise Hill Road, Montrose VIC 3765
 Tel (03) 728 5350

Spotlight on SWLing

Robin L Harwood VK7RH*

I have found conditions of late to be rather discouraging. Wintertime propagation, especially during the daylight hours, was fair to good. The 49 metre band openings from 0200 UTC were audible this year and signals became stronger. I did notice Radio Sweden on 6155 kHz at around 0230 UTC to North America provided quite good signals here. Naturally, old time listeners will query this as Radio Austria International has been using that channel for some time. That is the case and eventually both cause co-channel interference. They are also targeting the same area.

I also noted many Latin stations stayed on all-night during the World Cup in the USA. Although monitors in the Americas had a field day, I managed to hear the Caracol Network in Colombia on 5075 and 6150 kHz. The latter clashed with AWR in Costa Rica. European stations also aired live commentaries of the matches, which meant that regular programming was dumped or alternative channels employed.

One June Saturday evening, I was tuning across the Medium wave allocation and noted several strong heterodynes in 10 kHz spots. It was an opening to the US

mainland with KCWW in Arizona on 1580 kHz booming in at S 9. I was positively able to identify it because it was so strong. Incidentally, KCWW has been noted as early as 0730 UTC here. Other signals were observed on 1410 and 1420 kHz yet, unfortunately, no identification announcements were heard. I have an idea that the latter frequency is used in Hawaii. The Californian signal on 1540 kHz was also there but mixing in with the New Zealand station 1 kHz lower. Sadly, this marker channel is now blocked by a narrowcast broadcaster in Adelaide.

When I started out listening to shortwave, one of the first stations I logged and confirmed was the "Voice of Free China" in Taipei, Taiwan. Now I have come across this station after quite an absence. It is on 9610 kHz and 7130 kHz at 1200 UTC, transmitting in English to Australasia and Japan. Signals are quite good, particularly on the 31 metre band frequency. The VOFC also is relayed by WYFR in Okeechobee, Florida on 5950 kHz and 11740 kHz as part of a co-operative sharing scheme. WYFR is also heard on 9280 kHz in Chinese via VOFC, Taiwan, from 1000 UTC.

I noted that there is a new 10 minute Midweek edition of the "DX Partyline" on

Radio HCJB in Quito, Ecuador on Wednesdays at approx. 0700 UTC. Accordingly, "DX Partyline" at 0740 and 1010 UTC Saturdays has been shortened by 10 minutes. Also, on Wednesdays at approximately 0800 or 1030 UTC, "Ham Radio Horizons" with John Beck HC1QT is aired. HCJB is on 9745 and 11925 kHz between 0700 and 1100 UTC.

I now have facilities for receiving e-mail. If you have any news you wish to pass on, contact me at FIDONET 3:670/301. I have also accessed SPECTRUM BBS and found many SWL related files available there. It's number is (03) 455 1309. I'm pleased to find that these Bulletin Boards are providing a service for SWLs and DXers and will fill a need. If you do make use of SPECTRUM BBS, tell them you saw it in this column.

Well, that is all for August. Until next time, the very best of listening and 73.

*54 Connaught Crescent, West Launceston TAS 7250
 VK7RH@VK7BS LTN TAS.AUS.OZ

**Tell the advertisers
 you saw it in the WIA
 Amateur Radio Magazine.**

Silent Keys

Due to space demands obituaries should be no longer than 200 words.

The WIA regrets to announce the recent passing of:

R (Bob)	STEPHENS	VK3QJ
J (Jock)	VAILE	VK3PZ
E (Eric)	NORRIS	VK4ZEN
K J	GRIMES	VK6AKG
E F (Ted)	DAVIES	VK6ED

Ted Davies VK6ED

A man active in his church, a keen worker for local repertory theatre, State Emergency Service communications officer and instructor, and a keen radio amateur will be sadly missed from the Busseton (WA) scene. He was Ted Davies who died suddenly on 20 May.

His early career embraced training at the Marconi School of Wireless, Sydney, followed by several years at sea as a marine radio officer, taking out an amateur callign (VK2FE) and in subsequent years pursuing amateur radio. Ted was an active member of the WIA for many years. He

enjoyed participation in events like the Remembrance Day Contest and continually tried to drum up support in the RD from old and new CW operators.

Since the early 1980s VK6ED was a valued part of the Sunday morning WIA News network with his reliable 3582 kHz relay. One of his many friends echoed what must have been in numerous minds when the news circulated about his passing. "Ted was one of Nature's few true gentlemen; he'll be missed by us all".

Ron Baker VK6QB and VK6WZ
Harry Atkinson

Jock Vaile VK3PZ

Jock Vaile VK3PZ passed away on 3 June at the age of 79. Although he had been ill for a considerable period, he had continued his work as a Repetition Engineer right up to a few weeks before his admission to hospital.

Jock was one of the early venturers into

SSB and he participated in the SSB Group picnics to Hamilton and other places. He also served on the *Amateur Radio Publications Committee* for a period.

Jock was also a versatile sporting enthusiast, being not only accomplished in ice speed skating and water ski-ing, but indulging also in Formula V motor racing at such venues as Calder and Phillip Island. He was also a skilful portraitist in pencil. His areas of conversation were remarkable.

Among Jock's products as an engineer was an excellent automatic (bug) Morse key which the Police Department was pleased to use for some years.

So that he could listen on the ham bands while working on his lathes, Jock fitted up an ingenious audio-derived AVC and a series of speakers to enable him to read the "ham mail" no matter at which bench he was engaged.

To his widow, Jill, and his four sons we extend our deep sympathy.

Ivor Stafford VK3XB
Mavis Stafford VK3KS

Technical Correspondence

All technical correspondence from members will be considered for publication, but should be less than 300 words.

"TCF" Transceiver for 80 m

During development of a 40 metre version of the "TCF" transceiver, a couple of improvements were found which may be of interest to those who have made, or are making, the 80 m model.

Significantly improved frequency stability between Tx and Rx overs may be obtained by replacing the two 6.2 V zeners which supply +6.2 V (T) and +6.2 V (R) with 7806/1A chip regulators (much better thermal stability than zeners). The zener "warmup" which causes a drift of about 10 Hz is thus eliminated. Remove the zener and the 470 ohm dropping resistor from each of the Tx and Rx boards respectively. There is sufficient copper foil for the common pin of the 7806 to be soldered in the spot vacated by the 470 ohm resistor(s). The input pin of the chip connects to +12 V and the 6 V output pin becomes +6 V (T) and +6 V (R) accordingly. The chips should have a 0.1 μ F monolithic bypass capacitor to ground near each of the input and output pins. Whilst holding the chip with pins pointing down and the type number facing you, the 12 V input pin is on the left, common (ground) is middle, and output 6 V is on the right.

More audio power on receive may be obtained by connecting a small

electrolytic or tantalum capacitor between pins 1 and 8 of LM386, positive pole to pin 1.

May I say that the "TCF" 80 has been (or is) a popular project. Numerous individuals, clubs and even students of one of the TAFE colleges have shown an interest, and many sets are up, going, and "on air". Work on a 40 metre model is well in hand and will appear in *Amateur Radio* in due course. Thanks to those who took the trouble to send suggestions.

Drew Diamond VK3XU

Choke Balun

In *Amateur Radio*, June 1994, Lindsay Lawless VK3ANJ had quite a lot to say about the so called Choke Baluns used to interface coax cable to a balanced antenna. One arrangement involves coiling the coaxial line to make an inductive choke and the other does the same using a ferrite sleeve around the cable. According to Lindsay, this causes a discontinuity in the impedance of the line. He supports this argument with some theory on mutual inductance and measurement results carried out on 9 turns of RG58 cable wound on a 110 mm former.

Not convinced, I duplicated his 9 turn test choke and carried out some tests my own way. In October 1989, *Amateur Radio* published my article entitled

"Transmission Lines — Measurement of their Characteristics". This article included a method of deriving characteristic impedance by measuring the line constants. To reiterate, a short length of cable is used not greater than one eighth wavelength at the frequency of measurement. Shunt capacitance (C) is measured at one end with the other end open circuit. Series inductance (L) is measured at one end with the other end short circuited. At high frequencies the following formula applies:

Characteristic Impedance $Z_0 = \sqrt{L/C}$ where L = Series Inductance per unit length

C = Shunt Capacitance per unit length

Now I used this method to measure the characteristic impedance of the coiled up sample of cable. A Q meter was used to determine inductance and capacity using frequencies between 2 and 6 MHz and capacity was also checked using a digital capacitance meter. The measured capacitance was close to 330 pF and the measured inductance close to 1 μ H giving a derived impedance of 55 ohms (close enough to the 53.5 ohm specification for the RG58 cable).

The cable was then uncoiled making a length of 3.3 metres and the tests were repeated. Guess what? The tests produced precisely the same result. This did not surprise me at all as I could relate to experience in my old work place where I had carried out a lot of measurements on transmission line cables both rolled up

on drums and run out. On various cable samples tested, I do not recall noticing any significant difference in the value of characteristic impedance measured on the drum from that with the cable unrolled.

So I do not support Lindsay's concern that the coax choke balun upsets the impedance continuity. If there is an effect, it is probably insignificant.

Anyway, I feel that Lindsay's analysis using mutual coupling between the common mode currents and the differential currents is not relevant to the coaxial cable. The whole idea of the concentric outer conductor in the cable is that the fields generated are confined to an area inside the perimeter of the outer conductor. The confined fields are prevented from causing radiation and are unaffected by fields outside the outer conductor. Transmission line current in the outer conductor is confined by skin effect to the inside edge of the outer conductor. However, what does concern us is current which is allowed to pass down the outside edge of the outer conductor thus creating an external field which does cause radiation. By inserting the choke arrangement, we are aiming to impede the flow of this external current and reduce radiation from the cable.

Lindsay's analysis is based on unwanted current flowing in common mode with its field mutually coupled with fields from the differential currents. Whilst this might be a valid form of analysis for a balanced line, it does not apply to the coax line. In the latter, the undesired current is neither common to both inner and outer conductors nor is its field mutually coupled to the confined field inside the coaxial line.

In our balun choke, the inductance in a section of the outside of the outer conductor is increased by winding the cable in a coil or enclosing it with a ferrite sleeve. As the fields between the inside and outside of the cable are prevented from intercoupling, the change in inductance does not affect the inductance per unit length on the inside of the cable and hence the characteristic impedance is unchanged.

One can expect that the undesired external current will have its own nodes and anti-nodes down the cable. It seems to me that, if you can pick a high current point, then that is the best place to incorporate the choke for maximum effect. Providing the choke has sufficient inductive reactance, it seems like a fine idea to reduce radiation from the cable with minimal impedance discontinuity.

Lloyd Butler VK5BR
18 Ottawa Avenue
Panorama SA 5041

VHF/UHF — An Expanding World

Eric Jamieson VK5LP*

All times are UTC

Six Metres Standings List

DXCC Countries based on information received up to 20 June 1994.

Column 1: 50/52 MHz two-way confirmed contacts

Column 2: 50/52 MHz two-way claimed as worked but not confirmed

Column 3: Crossband 50/52 MHz to 28 MHz confirmed

Column 4: Crossband 50/52 MHz to 28 MHz worked

Column 5: Countries heard on 50/52 MHz

Call sign	1	2	3	4	5
VK3OT	100	102			
VK4KK	93	93		4	
VK4BRG	86	90			
VK2QF	85	85		3	
VK2BA	69	69			
VK4ALM	68	70			
VK4ZAL	68	68			
VK2BBR	54	64			
VK4JSR	53	56		8	
VK4TL	51	54			
VK6HK	47	47		3	
VK8ZLX	45	60	1		
VK3AMK	45	47			
VK8BG	42	42		3	
VK5RO	39	48	3		
VK6RO	39	39	1	1	
VK1RX	39	39		9	
VK6PA	36	57			
VK3AUI	36	36			
VK5LP	35	38		9	
VK3AWY	34	36			
VK3BDL	32	32			
VK3NM	31	34			
VK5BC	29	63			
VK2DDG	25	28	2	3	
VK4ZJR	25	25			
VK4KHZ	23	34			
VK3XQ	23	25		2	
VK2KAY	21	23			
VK2BNN	20	21			
VK9LG	20	20			
VK7JG	20	22		2	
VK4BJE	19	25			
VK4KAA	19	20			
VK3TU	17	19			
VK2ZRU	16	19		4	
VK4ZSH	16	16			
VK2ZSC	16	29			
VK9LE	14	14			
VK3ALM	13	15		7	
VK3KTO	11	11			
VK5KL	11	19	1	7	
VK6OX	10	10		1	

Overseas

JA2TTO	48	48		6	
YJ8RG	25	25			

After fourteen years this is the last "Standings List". I propose publishing. There seems little interest in its continuation and I refer you to the May issue of *Amateur Radio* if you need further information on the matter. However, I am pleased that this last list has at its top an operator who has finally confirmed 100 countries from Australia and three others at 85 and above, all of whom should be pleased with their results.

I thank those operators who have been very loyal to me during the fourteen years that the list has been operational, particularly those who promptly and regularly sent updates. Most operators sent photocopies or original cards in support of their claims and for this I am grateful as it did involve you in expense and time. It has been quite a task and expense (phone calls and letters) for me to keep the list updated but it has been a very interesting exercise.

Your submissions were a very useful source of information when it came to preparing the "First Worked List" which was published last month in *Amateur Radio* and which will appear in the *UK Six Metre Group Newsletter* in due course. The information I have will not be destroyed but kept on file as a source of material should it be required in the future.

10 GHz Operations

The South East Radio Group Convention over the Queen's holiday weekend saw a very enthusiastic group of VK5s display their narrow-band 10 GHz equipment. The equipment design varied from the early German, late German and English circuitry. Each unit provided an output of around 200 mW and, when led into the 60 cm dishes, resulted in an ERP of about 200 watts. David VK5KK also displayed his 3.5 GHz equipment.

The five operators were Mark VK5EME, David VK5KK, Chris VK5MC, Trevor VK5NC and Roger VK5NY. John VK5DJ, who judged the home-brew competition, said the entry of all this superbly built 10 GHz equipment would rival anything likely to be produced elsewhere. All the equipment is based upon transverters with two metres as the tuneable IF. All the equipment has been designed to be used portable and moved to a suitable site at very short notice.

The equipment was not taken to Mount Gambier simply for show purposes — it was in fact put to good use. Details of

some contacts as follows. On 11/6 at 0500 VK5MC/p at Hatherleigh, west of Millicent worked VK5NY/p in Mount Gambier at the Browns Lake Lookout car park, height around 120 m and a distance of about 60 km with signals up to 5x9 VK5KK/p went to the 187 m Mount Gambier Centenary Lookout and found the extra height above VK5NY gave him solid 5 x 9 + 20dB signals to VK5MC and more than comparable signals to VK5NY several hundred metres below him! The contacts continued until 0545.

First VK5-VK3 10 GHz Contact

On 13/6 it was decided to attempt what would probably be the first VK5 to VK3 contact on 10 GHz. Roger VK5NY was east of the crater at Mount Gambier and David VK5KK went to a fire lookout at Rennick and all of 0.5 km inside Victoria! David climbed to the 16 m level of the tower, carrying all the equipment, including the gel battery, on his back. The first half of the ladder was open and straight up. David hung the dish over the side of the railing and took a compass bearing and found the tower was orientated E-W which meant little redirection of the dish was involved. At 0030 he contacted VK5NY over the 16.5 km path with signals to 5x9 despite the need to look through some trees at the VK3 end. This somewhat "tongue-in-cheek" contact raised a few eyebrows!

Obviously the 10 GHz gang had quite an interesting time testing the high spots around Mount Gambier and they hope this will inspire the VK3s to match their efforts. Of course, from the VK5 viewpoint, all eyes are enviously cast towards the west in the hope that eventually they will crack the 1880 km distance to Albany in VK6.

While on the subject of microwaves, VK6CC has put together a Packet listing of 22 callsigns in VK and ZL who have displayed an interest in 10 GHz operation. Most are using wide-band equipment but, with the VK5 successes, they are now looking towards narrow-band equipment. Information is swapped and problems sorted out. The idea has been running for about two months.

Maritime Mobile

From the *Geelong Amateur Radio Club Newsletter* are a few lines which said that Bert VK3TU operated two metre portable from VK7 over the period 18-20 May. On the way he worked Charlie VK3BRZ using only 10 watts PEP and a dipole from his cabin inside the *Spirit of Tasmania*, when halfway across Bass Strait. He also made contact from Gladstone, Burnie and Wynyard in Tasmania to VK3, in the process activating three rare locator grids, QE28, QE29 and QE49



Another view (see front cover) of the equipment used by David VK5KK in his portable, twilight adventures on 10,368.050 MHz SSB.

HiM-topping on 1296 MHz

Following the earlier successes using aircraft enhancement by stations situated on the Melbourne-Sydney path, it was reasoned similar results should be possible between Sydney and Brisbane. However, in earlier years, Rod VK4BRP in Ipswich had consistently better results working Gordon VK2ZAB at Berowra Heights north-west of Sydney, than those stations in Brisbane, when using a site 30 km north of Kilcoy near Jimna in the Connondale Range which is about 120 km north-west of Brisbane.

Doug VK4OE reports on his excursion on 25-26 June to this site reasoning that he too would probably stand a better chance of working to the greater Sydney region than from Brisbane but also being north of Ipswich it would provide a further extension of the path length. If successful it would create a new Queensland distance record for the 1296 MHz band.

Doug spent much time listening to receiver noise on 144 and 1296 MHz with liaison on 40 metres or cellular phone to Lyell VK2BE in south-east Sydney and Ross VK2DVZ near Taree about 200 km north of Sydney. On two occasions Lyell's 1296 CW idled rose out of the noise for ten to fifteen seconds but the duration was too short and too infrequent to allow a completed contact to occur.

Doug writes, When using 144 MHz it was discovered that signals between my portable location and Taree were more reliable (when they were there) than to Berowra Heights, peaking to 5x7 for about

one minute. Ross and I quickly realised that when 144 MHz was "up" 1296 MHz was also propagating and it was during such short windows that Ross heard my 1296 MHz SSB signal once (he was doing most of the transmitting) and I heard his beacon ident on two occasions.

Although the windows to Ross were a little longer than those to Lyell in Sydney, contact between Ross and myself was not completed mostly due to the time required by Ross for necessary transmitter adjustment (water cooled 2C39s) when changing from beacon transmit mode to SSB.

Whilst the fact that propagation over the paths was demonstrated to occur and it was quite exciting to observe, the "windows" were too short. This can be explained by the fact that in the case of the Melbourne-Sydney path the aircraft travel nearly on a straight line and passing more or less over Canberra allowing sustained enhancement for contacts between those three cities.

When travelling between Sydney and Brisbane the aircraft track inland a little, fly parallel to the coast for most of the way and when over northern NSW they change direction to complete the journey to Brisbane airport which is essentially on the coast on the north-eastern side of Brisbane. This "dog-legged" path clearly is not ideal for aircraft enhancement of VHF/UHF signals but it does work to some extent. The known 144 and 432 MHz contacts between VK2ZAB and Brisbane and Ipswich stations attest to this.

I believe that this non-aligned path is the reason for the usually marginal signals between Brisbane and Berowra Heights, and for the virtually complete absence of aircraft enhanced propagation to stations within the city of Sydney. It also explains the short "windows" of propagation which I experienced as being due to aircraft only crossing the line between us rather than flying along the line.

Another observation is that signals between my location and Taree were consistently better than to Sydney-area stations indicating that the Sydney path length was close to the limit for propagation by this mode.

Doug concludes by saying the results obtained indicate it should be possible to successfully complete a contact on 1296 MHz and maybe higher frequencies providing that alignment with aircraft flight paths is made more accurately. Given the "dog-legged" path between Sydney and Brisbane those in Queensland may need to travel to places more in alignment with the paths used by aircraft travelling between Sydney and Asian ports.

He also said that, as the use of digital mode increases, with sufficient signal strength contacts could be completed due to the faster transfer of information. He was most impressed with the results from using a Timewave DSP9 signal enhancer which allowed him to receive signals which otherwise were well down in the noise. He was able to prove this as he had the facility of being able to switch the enhancer in and out of circuit.

Technical Symposium

The South Coast Amateur Radio Club will hold its second annual SA Technical Symposium at the Onkaparinga Institute, O'Halloran Hill Campus with a tentative date of 17 September.

Further information appears in the Amateur Radio "Clubs Corner" section this month, and will appear on Packet and on Divisional WIA broadcasts. A ticket is necessary for attendance.

Closure

Specific information on band usage is scarce this month so it appears operators prefer to sit by the fire than operate from a cold shack!

Closing with two thoughts for the month:

1. I prefer the errors of enthusiasm to the indifference of wisdom, and
2. It is a tribute to the spontaneous vitality of truth that we never say somebody "blurted out" a lie.

73 from The Voice by the Lake.

*PO Box 169 Manning SA 5264

Fax 085 751 043 Packet VK5LP@VK5ZK

ar

What's New

with Bob Tait VK3UI*

ARRL Announces Third Edition of The ARRL Satellite Anthology

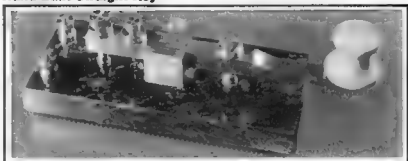
In order to keep up with the ever expanding amateur radio satellite activity, the American Radio Relay League (ARRL) has published the third edition of its popular Satellite Anthology.

This edition contains QST satellite articles published from 1986 to 1993. Profiles are given for the latest OSCAR satellites such as KITSAT-OSCAR 25, ITAMSAT-OSCAR 26, and AMRAD-OSCAR 27. Seven pages are devoted to the new Phase D satellite which is scheduled for launch in 1995 or 1996. The

phase D project promises to provide satellite access to most amateurs. A detailed analysis of this ambitious project is given.

The Satellite Anthology provides technical support for both veterans and beginners. Packet enthusiasts can get information on how to access FUJI-OSCAR 20; you can find out about the humorous guide to this satellite in "KICE's Secret OSCAR 20 station" if you are interested in viewing images you will want to read "Webersat step by step". This book is available from DAYCOM Communications Pty. Ltd, 37 Fenton St, Huntingdale, VIC 3166. Ph (03) 543 6444. Order code BR476. Price \$22.00.

Hand Built Straight Key



From Derek Stillwell comes what must be the finest looking straight key that we have seen for some time. Being an instrument maker and giving attention to detail, Derek has indeed produced a key which would be a pleasure to use and become a much treasured possession. Each key is individually hand-crafted, has a solid brass arm and bearing block, and has fully adjustable ball and cone bearings so you can get the contact gap as fine as you like, and it will not vary during the longest of contest sessions.

The whole assembly is mounted on a black marble base, measuring 178 x 76 x 19 mm, which has a ribbed rubber mat fitted to its underside to reduce noise and

prevent slippage. The knob is an improved design having a concave upper surface to prevent fatigue during long overs, and is available in three types of timber. Box, Zebrano or Padauk. Each key is engraved with the makers name and serial number and, if required, your call sign.

These keys will only be made in limited numbers and are therefore destined to become a collectable. Further information about these keys can be gained by sending a SASE and 2 IRCs to Derek Stillwell, Instrument Maker, 27 Lesley Owen Way, Shrewsbury, Shropshire England SY1 4RP.

Debeglass Wire



This product is a non conductive fibre glass yarn which is ideally suited for non conductive guys for towers and masts where the radiation pattern would be affected by metallic guys. All that is required is the special Debecclip and a Philips screwdriver. This makes installation very easy in the field.

Sizes from 4 mm to 12 mm, and tensile strengths from 430 kg to 3420 kg, are available. For further information contact GFS Electronics, 17 McKeon Road, Mitcham, VIC 3132 Phone (03) 873 3777. Fax (03) 872 4550.

The Quad Antenna

Did you know that the Quad Antenna was invented in 1942 in Quito Ecuador to solve a problem with corona discharge? Do you ever get into discussions with your friends about the merit of Yagis versus

Quads. Well, if you read this excellent book by Bob Haviland W4MB you should become well versed on Quads; you may even become a convert. This book contains in depth information on all manner of Quads, how to feed them, polar plots, the mathematics, impedance charts and much more. It is written in such a way it can be understood by beginners and engineers alike.

It is sometimes difficult to find data on Quad and Loop antennas. This book has it all. Bob Haviland has devoted a life's work to this antenna. The book includes

all the Quad families, such as Delta Loops, Skeleton Slots, Circular Loops, Horizontal Loops, Swiss Quad, Bird Cage, Folded Dipoles, the Shorted Transmission Line Antenna and much more. Bob uses the MININEC program to provide the reader with polar plots, ground effects and radiation patterns for most Quads.

This book is available from DAYCOM Communications Pty Ltd, 37 Fenton St, Huntingdale, VIC 3166. Ph (03) 543 6444. Order code BR41. Price \$3750.

*PO Box 2175, Caulfield Junction VIC 3161

QSP News

No Proof That Cellular Phones Cause Cancer

Recent reports based on ignorance and confusion

(A media statement by the Institution of Engineers, Australia, dated 17 May 1994)

The Institution of Engineers, Australia today expressed concern at disturbing reports that cellular phones are causing brain cancer.

Alex Baitech, a vice president of the Institution, said that recent reports originating from the United States should be treated cautiously as studies have failed to produce scientifically sound evidence to support a connection between cellular phones and cancer.

"Claims of this nature are unjustified. Two very different types of fields have been subject to study: extremely low frequency fields, such as power lines and operating electrical equipment, and microwave-fields, such as those surrounding cellular phone antennas", Mr Baitech said.

The results of studies in the two areas are totally unrelated but in neither case is there any conclusive evidence, he said.

Mr Baitech said that a lack of understanding had also resulted in other types of telephones, which are not part of the cellular network, also being questioned.

"It was important to differentiate between cellular telephones which might warrant further investigation, and telephones which we know constitute no risk at all".

Cellular phones transmit by radio to a transmission tower

which is part of a national grid. Cordless phones — which have a separate base which allows the user to wander freely — are not cellular and have very much lower signal power levels. They communicate directly with the base unit which is wired to normal phone lines, he said.

According to Mr Baitech, car phones have also been wrongfully implicated. The car phone's antenna is mounted outside the car, on the car's roof, boot or rear window, at a sufficient distance from the user to have a negligible effect.

Further research is being done to clarify the cellular phone situation as some past research had produced contradictory results, he said.

"Most cellular phones in Australia transmit at a frequency between 825-915 MHz. Significant testing has been done into the effects of microwave radiation at this frequency, and most researchers agree that these waves would not initiate cancer growth", Mr Baitech said.

"However, there have been studies which have found changes in the function of the cells exposed to microwaves. It is worth pointing out that some of these studies have included the treatment of animals with cancer-causing chemicals and exposing them to radio frequency energy for up to 22 hours a day. While the studies have said that changes occurred, they did not claim that they caused

damage, or could aggravate cancer", he said.

According to Mr Baitech, research has also indicated that microwaves could accelerate a reaction already occurring between carcinogens and the body tissue. It has also been proposed in other studies that microwaves could damage the blood brain barrier which protects the brain against certain toxins, or could upset the uptake of calcium by cells, thereby disrupting normal cell functions.

Each of these findings have been contradicted by other research, including that by Telecom Australia, Mr Baitech said.

"People should remember that cellular phones in Australia conform to international safety standards. These standards are the result of years of work by engineers, biophysicists and medical researchers", he said.

"Given that the weight of scientific research has not found any link between cellular phones and cancer, allegations of health risks should be viewed as unsubstantiated and unwarranted", Mr Baitech said.

"A 'class action' by cellular phone users in the United States has been disallowed by the courts. Two law suits are currently being processed in the U.S.

Further information:

Mr Alex Baitech
Vice President
Institution of Engineers, Australia
Ph: (02) 899 7790

HF PREDICTIONS

Evan Jarman VK3ANI

The Tables Explained

The tables provide estimates of signal strength for each hour of the UTC day for five of the bands between 7 and 28 MHz. The UTC hour is the first column; the second column lists the predicted MUF (maximum useable frequency), the third column the signal strength in dB relative to 1 μ V (dB μ) at the MUF; the fourth column lists the "frequency of optimum travel" (FOT), or the optimum working frequency as it is more generally known.

The signal strengths are all shown in dB relative to a reference of 1 μ V in 50 Ohms at the receiver antenna input. The table below relates these figures to the amateur S-point "standard" where S9 is 50 μ V at the receiver's input and the S-meter scale is 6 dB per S-point.

V in 50 ohms	S-points	dB(μ V)
50.00	S9	34
25.00	S8	28
12.50	S7	22
6.25	S6	16
3.12	S5	10
1.56	S4	4

0.78	S3	2
0.39	S2	-8
0.20	S1	-14

The tables are generated by the GRAPH-DX program from FT Promotions, assuming 100 W transmitter power output, modest beam antennas (eg three element Yagi or cubical quad) and a short-term forecast of the sunspot number. Actual solar and geomagnetic activity will affect results observed.

The three regions cover stations within the following areas:

VK EAST The major part of NSW and Queensland

VK SOUTH Southern-NSW, VK3, VK5 and VK7

VK WEST The south-west of Western Australia.

Likewise, the overseas terminals cover substantial regions (eg "Europe" covers most of Western Europe and the UK).

The sunspot number used in these calculations is 23.0. The predicted value for September is 21.6.

VK EAST — SOUTH PACIFIC														
UTC	MUF	dB μ	FOT	7	14	18	21	24	9	12	15	18	21	24
1	22.1	25	16.6	11	35	32	25	18						
2	22.1	25	16.6	12	35	32	27	18						
3	22.0	25	16.6	16	36	32	27	18						
4	21.7	26	16.4	22	37	32	27	18						
5	20.6	27	15.8	31	39	33	26	15						
6	18.8	30	14.7	47	41	32	23	10						
7	16.7	33	12.7	51	40	28	17	1						
8	14.8	35	11.2	53	37	24	13	8						
9	13.0	37	9.8	53	32	14	-1	-23						
10	11.9	39	8.9	54	28	8	-9	-34						
11	11.3	39	8.4	53	26	4	-14							
12	10.0	42	7.9	52	22	0	-21							
13	10.1	41	7.5	51	19	4	-27							
14	9.9	41	7.4	51	18	6	-29							
15	9.5	40	7.1	51	16	8	-31							
16	9.1	42	6.9	50	13	13	-38							
17	8.0	43	6.1	47	4	-27								
18	8.3	43	6.4	48	6	-24								
19	10.9	39	8.4	51	23	1	-18							
20	15.1	31	11.7	39	34	21	9	8						
21	18.4	28	14.7	27	36	28	20	7						
22	20.7	26	15.4	18	35	30	24	13						
23	21.0	26	16.0	14	35	31	25	15						
24	21.5	25	16.3	12	34	31	25	18						

VK WEST — SOUTH PACIFIC														
UTC	MUF	dB μ	FOT	7	14	18	21	24	9	12	15	18	21	24
1	18.5	11	14.0	26	15	12	5	-6						
2	18.5	11	14.0	26	15	12	7	-4						
3	18.6	12	15.2	25	17	14	8	-2						
4	19.6	12	14.7	-20	18	15	9	2						
5	19.6	13	14.7	9	21	17	9	1						
6	16.6	16	14.8	24	16	7	6	8						
7	16.3	20	13.3	27	25	14	1	-16						
8	14.4	24	10.8	39	24	8	7	-29						
9	12.6	26	9.5	42	20	0	-19							
10	11.1	29	8.5	43	15	-11	-34							
11	10.1	31	7.6	43	8	-20								
12	9.7	31	7.2	42	5	-25								
13	9.3	32	6.9	41	2	-29								
14	8.9	32	6.6	40	0	-33								
15	8.9	32	6.7	40	-1	-35								
16	8.9	32	6.7	40	0	-33								
17	7.4	34	6.0	37	0									
18	6.1	37	6.2	36	8									
19	8.1	32	6.2	37	-9									
20	8.5	24	6.5	26	5	-37								
21	10.2	19	8.6	16	5	-17								
22	13.2	15	10.2	9	13	0	-14	-36						
23	15.8	13	12.1	-11	15	8	-2	-17						
24	17.5	12	13.4	-20	15	11	3	-9						

VK EAST — AFRICA														
UTC	MUF	dB μ	FOT	7	14	18	21	24	9	12	15	18	21	24
1	20.3	9	8.8	3	-2	-35								
2	7.3	-2	5.5	-4	-8	-33								
3	7.5	-6	5.6	-12	-7	-27								
4	10.4	-1	8.0	-28	1	-10	-2	-18						
5	14.7	4	11.4	4	4	-5	-18							
6	18.9	5	13.2	4	4	-1	-11							
7	16.7	5	12.5	5	4	-1	-11							
8	15.1	5	11.3	2	2	-5	-18							
9	13.1	5	9.8	-32	5	-1	-12	-28						
10	11.4	5	8.5	-20	4	-7	-21							
11	9.9	6	7.4	-9	1	-15	-33							
12	9.0	8	6.7	9	-1	-33								
13	8.6	14	6.4	11	-3	-29								
14	8.4	21	6.2	21	-5	-35								
15	8.2	25	6.0	28	-6	-39								
16	8.3	28	5.1	32	6	-39								
17	8.2	29	6.2	34	-8									
18	8.0	30	6.0	34	-10									
19	7.9	31	14.7	-13	-14	18	9	3						
20	7.8	30	8.0	-33	-12									
21	7.8	30	6.0	-33	-12									
22	7.8	29	5.9	-30	-14									
23	7.2	19	7.7	-18	-13									
24	7.6	14	8.0	13	-11									

VK SOUTH — AFRICA														
UTC	MUF	dB μ	FOT	7	14	18	21	24	9	12	15	18	21	24
1	17.8	6.1	3.3	-7	-38									
2	8.2	11	6.3	7	-5	-31								
3	11.0	11	6.1	-2	8	-29								
4	11.1	11	6.1	-2	8	-29								
5	17.2	9	13.9	-37	10	8	-2	-18						
6	18.0	8	14.6	-	8	8	3	-10						
7	17.8	8	14.1	-	8	7	1	-9						
8	16.6	16	13.2	-29	6	6	-1	-13						
9	15.1	8	11.9	-29	8	3	-5	-20						
10	13.3	9	10.4	-16	8	-1	-13	-31						
11	11.5	9	9.0	-8	5	-8	-24							
12	10.0	11	7.8	2	1	-18	-38							
13	9.0	15	6.9	12	3	-29								
14	8.4	21	6.5	23	-7	-39								
15	8.1	25	6.2	28	-10									
16	7.9	28	6.0	31	-12									
17	7.9	29	6.0	33	-13									
18	7.8	30	6.0	33	-14									
19	7.7	30	6.0	32	-16									
20	7.5	30	5.9	32	-18									
21	8.0	30	6.3	34	-12									
22	8.0	30	6.2	34	-11									
23	7.7	29	5.9	33	-14									
24	8.2	22	6.4	24	-8									

VK WEST — AFRICA														
UTC	MUF	dB μ	FOT	7	14	18	21	24	9	12	15	18	21	24
1	7.4	23	5.7	23	-14									
2	7.5	14	5.8	13	-11									
3	10.6	12	7.8	2	4	-13	-32							
4	11.0	11	11.8	18	12	5	-21							
5	17.3	9	13.2	-34	11	8	1	-10						
6	18.2	8	12.7	-	10	9	3	-7						
7	18.3	8	12.7	-	9	8	3	-7						
8	17.8	8	12.6	-	9	8	3	-7						
9	16.8	8	12.6	-	9	6	0	-12						
10	15.2	9	11.4	-28	9	4	-5	-20						
11	13.2	10	9.9	13	9	-1	-14	33						
12	11.5	12	8.8	-1	7	-8	-28							
13	10.0	16	7.4	12	2	-19								
14	9.1	21	6.7	23	-2	-30								
15	8.7	26	6.4	30	-4	-38								
16	8.4	28	6.2	33	-7									
17	8.3	30	6.2	36	-8									
18	-8.3	31	6.2	36	-7									
19	8.4	31	6.3	36	-7									
20	8.0	31	8.1	35	-11									
21	7.8	32	5.6	34	-16									
22	7.9	31	6.1	31	-12									
23	8.4	31	6.4	37	-6									
24	7.8	31	6.0	34	-12									

VK EAST — EUROPE										VK SOUTH — EUROPE										VK WEST — EUROPE									
UTC	MUF	dBu	FOT	7.1	14.2	18.1	21.2	24.9		UTC	MUF	dBu	FOT	7.1	14.2	18.1	21.2	24.9		UTC	MUF	dBu	FOT	7.1	14.2	18.1	21.2	24.9	
1	8.6	-6	6.9	-34	1	0	-9	-22	-30	1	10.1	4	7.1	-18	3	-9	-25	-		1	10.6	15	7.3	7	6	-11	-30		
2	9.5	-12	6.8							2	9.8	-4	6.9	-39	1	-8	-32	-		2	10.2	4	7.1	18	2	-12	-28		
3	10.4	-11	6.8							3	10.9	-7	7.7	-	-	0	-14	-30		3	11.3	0	7.9	-37	2	-6	-18	-36	
4	12.4	-7	8.7							4	13.1	-3	8.0	-	-	0	-14	-30		4	13.7	0	8.3	-	1	0	-7	-19	
5	14.6	-2	10.7							5	15.6	0	11.1	-	-	0	-14	-30		5	16.5	2	11.6	-	-1	3	0	-6	
6	16.2	0	11.9							6	17.3	2	12.3	-	-	0	-2	-1	-3		6	18.3	4	12.9	-	-3	3	2	-3
7	17.0	2	12.4							7	18.0	3	12.9	-	-	0	-3	-2	-2		7	19.1	4	13.4	-	-4	3	1	0
8	17.5	4	12.8							8	17.6	5	13.2	-	-	0	-3	-2	-2		8	19.6	4	13.7	-	-4	3	1	0
9	18.1	5	13.3							9	15.9	2	11.9	-	-	0	0	0	0		9	19.3	4	14.1	-	-2	4	3	-2
10	14.1	6	11.0							10	13.8	2	10.4	-	-	2	1	-5	-18		10	17.8	4	13.4	-	-1	4	1	-8
11	12.8	7	9.7							11	12.0	2	9.0	-39	4	-3	-13	-30		11	15.7	8	11.8	-	-4	6	1	-13	
12	13.7	9	9.4							12	13.4	3	7.8	-21	3	-9	-24	-		12	13.9	9	11.8	-35	4	6	1	-8	
13	11.1	12	8.4							13	9.5	7	7.1	-5	1	-17	-36	-		13	12.2	9	9.2	-15	7	4	-18	-38	
14	10.5	16	7.9							14	9.1	12	6.8	-	-	0	-23	-		14	11.2	13	8.5	-2	6	10	-27	-	
15	9.9	19	7.4							15	8.8	18	6.5	-	-	0	-24	-		15	10.8	16	8.1	-10	11	10	-36	-	
16	8.8	24	7.4							16	8.4	25	6.5	-	-	0	-24	-		16	10.2	23	7.6	-29	4	-2	-1	-36	
17	9.5	27	7.2							17	8.9	27	6.8	-32	-3	-34	-	-		17	9.8	25	7.4	-33	2	26	-	-	
18	8.8	29	6.7							18	8.9	29	6.7	-35	-2	-34	-	-		18	8.7	27	7.3	-36	1	-28	-	-	
19	7.8	30	5.0							19	8.5	29	6.4	-35	-6	-36	-	-		19	9.6	28	7.2	-37	1	-29	-	-	
20	7.6	30	5.0							20	8.0	29	6.1	-33	-12	-	-	-		20	9.0	29	6.8	-35	-4	38	-	-	
21	9.2	30	7.0							21	8.3	29	6.4	-34	-9	-	-	-		21	7.9	29	6.1	-32	-15	-	-	-	
22	9.5	22	7.2							22	8.8	27	7.7	-38	6	-21	-	-		22	8.2	28	6.3	-33	-12	-10	-	-	
23	10.8	12	7.6							23	9.0	23	6.9	-34	0	-27	-	-		23	8.9	29	6.8	-36	-4	-37	-	-	
24	10.0	1	7.1							24	10.8	16	7.4	-8	0	-9	-26	-		24	9.0	25	6.9	-30	2	33	-	-	

VK EAST — EUROPE (Long path)										VK SOUTH — EUROPE (Long path)										VK WEST — EUROPE (Long path)										
UTC	MUF	dBu	FOT	7.1	14.2	18.1	21.2	24.9		UTC	MUF	dBu	FOT	7.1	14.2	18.1	21.2	24.9		UTC	MUF	dBu	FOT	7.1	14.2	18.1	21.2	24.9		
1	11.6	11	7.9	-9	-	-	-1.4	-32		1	10.9	7	7.6	15	-5	-18	-38	-		1	10.6	3	7.4	-34	0	-7	-19	-36		
2	13.0	13	9.0	0	-	-	-8	-19		2	10.1	7	7.2	-8	-9	-34	-	-		2	10.6	3	7.4	-34	0	-7	-19	-36		
3	10.3	15	7.1	0	-	-	-8	-19		3	9.7	14	6.6	-7	-4	-14	-33	-		3	9.4	2	6.6	-12	0	-15	-31	-		
4	9.9	18	6.9	14	-7	-11	-30	-		4	9.4	18	6.8	-18	3	-18	-38	-		4	9.1	5	6.5	-4	-1	-18	-36	-		
5	9.7	23	6.7	24	-7	-14	-35	-		5	9.3	22	6.5	-24	3	-20	-	-		5	8.1	1	6.5	-2	0	-19	-39	-		
6	9.4	24	6.4	24	-7	-14	-35	-		6	9.3	22	6.5	-24	3	-20	-	-		6	10.1	12	7.2	-6	3	-13	-31	-		
7	12.4	23	8.9	27	16	3	-12	-32		7	12.0	22	8.8	-25	10	0	-10	-36		7	11.7	14	8.4	7	9	-4	-19	-		
8	10.8	19	8.2	14	11	-5	-21	-		8	11.5	16	8.0	-17	11	-4	-23	-		8	13.8	15	9.8	6	14	3	-8	-25	-	
9	8.9	8	6.6	1	1	-17	-37	-		9	10.0	13	7.8	-5	-	-18	-38	-		9	13.1	13	10.8	-	1	0	-12	-31	-	
10	13.9	9	8.4	-12	0	-15	-33	-		10	8.4	10	6.6	-5	-	-18	-38	-		10	11.1	8	8.8	-8	5	-7	-22	-31	-	
11	8.1	-5	6.7	-25	0	-11	-26	-		11	8.5	-2	6.6	-44	-2	-18	-36	-		11	9.7	0	7.4	-17	0	-13	-29	-		
12	8.8	-12	8.4	-32	0	-10	-23	-		12	8.5	-9	6.3	-21	-2	-18	-32	-		12	8.9	-8	6.8	-26	-3	-16	-30	-		
13	8.5	-17	8.4	-38	0	-8	-20	-36		13	8.1	-14	6.4	-29	-2	-18	-36	-		13	8.4	-14	6.4	-30	-3	-14	-29	-		
14	8.2	-27	8.4	-44	-	-	-27	-		14	14.1	-34	8.2	-29	-	-11	-22	-37	-		14	8.2	-29	6.2	-	-	-4	-19	-53	-
15	8.7	-37	8.5	-	-	-10	-18	-29		15	8.0	-	6.2	-	-19	-29	-	-		15	8.0	-	6.3	-	-19	-29	-	-		
16	8.3	-43	8.3	-	-	-16	-25	-35		16	7.8	-	6.1	-	-27	-36	-	-		16	8.0	-	6.1	-	-25	-34	-	-		
17	7.8	-49	8.3	-	-	-22	-31	-41		17	7.5	-	5.9	-	-31	-	-	-		17	8.0	-	6.1	-	-25	-34	-	-		
18	8.2	-53	6.3	-18	-25	-36	-	-		18	7.9	-	6.3	-	-34	-	-	-		18	7.7	-	6.0	-	-30	-	-	-		
19	8.8	-10	7.1	-1	-5	-13	-28	-		19	8.3	-	7.0	-	-14	-19	-29	-		19	7.4	-	5.8	-	-32	-	-	-		
20	12.7	-4	9.7	-	-	-1	-7	-18		20	11.8	-	8.2	-	-2	-3	-4	-14		20	7.8	-	5.8	-	-32	-	-	-		
21	11.1	21	9.4	-1	2	-2	-11	-2		21	13.1	-	9.0	-	-4	-9	-14	-		21	9.2	-37	9.9	-	-13	-18	-29	-24		
22	14.4	5	9.9	-	5	4	-2	-12		22	13.8	-2	9.8	-	-1	0	-4	-14		22	11.5	-11	9.6	-	-4	-5	-12	-31		
23	13.3	7	9.1	-32	7	3	-5	-19		23	12.8	0	8.8	-	-2	0	-8	-20		23	12.2	-5	8.6	-	-3	-4	-10	-31		
24	12.4	9	8.3	-18	9	1	-9	-25		24	11.8	3	8.1	-32	4	-2	-13	-29		24	11.2	-6	7.9	-	-1	-6	-14	-28		

VK EAST — MEDITERRANEAN										VK SOUTH — MEDITERRANEAN										VK WEST — MEDITERRANEAN										
UTC	MUF	dBu	FOT	7.1	14.2	18.1	21.2	24.9		UTC	MUF	dBu	FOT	7.1	14.2	18.1	21.2	24.9		UTC	MUF	dBu	FOT	7.1	14.2	18.1	21.2	24.9		
1	10.3	4	7.8	-27	2	-6	-22	-34		1	10.2	8	7.7	-9	-	-11	-29	-		1	9.4	15	7.2	7	6	-10	-25	-4	0	
2	11.3	4	10.7	-	-	-	-	-		2	10.7	7	7.9	-	-	-	-	-		2	10.2	8	7.2	-10	0	-7	-19	-35		
3	14.3	4	10.7	-	-	-	-	-14		3	14.3	14	11.3	-	-	-	-2	-4	-16		3	13.2	5	10.4	-38	5	-1	-11	-28	
4	18.6	4	14.1	-	-	-	-	-4		4	18.6	6	14.4	-	-	-	-	-	0	6	4	1	6	4	8	3	-	-		
5	21.1	5	18.0	-	-	-	-	-4	1	5	19.8	5	14.6	-	-	-	-	-	0	6	4	1	6	4	8	3	-	-		
6	20.9	5	16.8	-	-	-	-	-4	1	6	19.8	4	14.6	-	-	-	-	-	0	6	4	1	6	4	8	3	-	-		
7	19.9	4	15.1	-	-	-	-	-4	4	7	19.2	4	14.4	-	-	-	-	-3	4	-1		7	18.8	4	14.2	-	0	6	2	-4
8	18.2	4	13.8	-	-	-	-	-4	4	8	18.2	4	13.8	-	-	-	-	-3	4	-1		8	18.4	4	14.0	-	0	4	2	-5
9	18.2	4	13.2	-	-	-	-	-																						

HAMADS

TRADE ADS

● **AM-DON FERROMAGNETIC CORES.** For all RF applications. Send business size SASE for data/price to RJ & US Imports, PO Box 431, Karma NSW 2533 (no enquiries at office please). 14 Boanyo Ave (Karma) Agencies at Geoff Wood Electronics, Sydney Webb Electronics, Albany Assoc TV Service, Hobart Truscotts Electronic World, Melbourne Aplha Tango Products, Perth.

● **WEATHER FAX programs for IBM XT/ATs** *** "RADFAX2" \$35-00, is a high resolution shortwave weatherfax Morse and RTTY receiving program Suitable for CGA, EGA, VGA and Hercules cards (state which) Needs SSB HF radio and RADFAX decoder *** "SATFAX" \$45-00, is a NOAA, Meteor and GMS weather satellite picture receiving program Needs EGA or VGA & WEATHER FAX PC card, + 137 MHz Receiver *** "MAXISAT" \$75-00 is similar to SATFAX but needs 2 MB of expanded memory (EMS 3.6 or 4.0) and 1024 x 768 SVGA card. All programs are on 5.25" or 3.5" disks (state which) plus documentation, add \$3-00 postage. ONLY from M Delamunty, 42 Villers St, New Farm QLD 4005. Ph (07) 358 2785.

FOR SALE ACT

● **YAESU FT-77S 10 watt HF transceiver** in good condition, little use, microphone and handbook, suit mobile/portable use \$325, YAESU FV-707 digital VFO, twelve memories, suits above rig and/or FT707, excellent condition \$225. Richard VK1RJ (06) 258 1228 after hours.

FOR SALE NSW

● **AR-3000A** brand new, still under guarantee \$650 Bob VK2YBR (066) 45 3004
 ● **KENWOOD TS440SAT** txcvr auto ATU, MC80 mic, mint \$1550 KENWOOD PS50 hi/ptu power supply \$450 YAESU FRG7700 HF RX memory \$350 MFJ tuner/amp new \$185. Can't separate RX and tuner, all vgc. Colin VK2AHD (069) 21 1004
 ● **STEEL** tower 22 m, rotating, tilt over, professionally made, free standing \$900 Ron VK2BKN Te/Fax (069) 72 2021
 ● **TET EMTROM TE 23** m three element three band antenna \$300 EA1300A Tuner \$225, MICRONTA world clock \$50 Peter VK2FFA (043) 24 4160
 ● **YAESU FT101IE** txcvr, spare finals 6JS6C x 2, manual s/n 7G280520, \$450, YAESU digital display YC-B018, manual, s/n 81010498, \$120, YAESU desk mic, imp 50 kohms, YD-844, \$60 MARINE 12 ch txcvr, AM, s/n 4060695, Teleradio model GT84 cradle, ant, \$130 Albert VK2NJS QTHR
 ● **YAESU FT101Z HF** txcvr s/n 94090677, YAESU FC-901 antenna tuner s/n B0303040, YAESU FV-107 external VFO s/n 0H040066, tuner plus 3 Mic and spare finals, \$600, YAESU FT-757GX HF txcvr s/n 5F580138 with hand mike, \$900 Ken VK2DYX QTHR (065) 51 2024.

● **KENWOOD TS-520 HF** txcvr, s/n 550408, with remote VFO-820, s/n 730047, manuals plus extras, MC-50 desk mic, LAO \$500 the lot. Graham VK2FGI (066) 24 2219 QTHR
 ● **SATELLITE** alum dish 2.2 m with rods (no base), NEC 1022 receiver with audio board fitted and working, \$240 the lot, will separate. Bruno VK2BPO QTHR (02) 713 1831
 ● **STANDARD CNB161** nicad battery pack, 700 mAh, for Standard 2 m h/held, gc, \$60 YAESU FT-4700 dual band 2 m/70 cm mobile with front panel separation kit for secure boot mounting (YSKIL long 6 m cable version), brand new, never unpacked, \$1190 (\$400 under new price incl mounting kit) Brad VK2QKH, day and early evening (02)906 5855, other times 018 640 377

FOR SALE VIC

● **VERTICAL HF** antenna Hidaka 5 band trap VS-41/80KR 3.5 to 28 MHz with 7 MHz radial loading coil, 9 metre high, gc, \$120. David VK3DNG QTHR (03) 859 4698.
 ● **YAESU FRG7700** very good condition \$400, KENWOOD desk mic MC80, vgc, \$75. Andy VK3BEL QTHR
 ● **QUANTITY** of teletype equipment, models 15, FRXT 14, tape readers, reperfors, loop supplies, paper rolls, tape, manuals, etc. Free to genuine collector. Steve VK3ZY QTHR (03) 807 4748.
 ● **SATELLITE** tuner (C band), 950 MHz — 1750 MHz made by "Advance" named "model Galaxy BS Tuner AGC and system" brand new in box with instruction book \$185. W Babb VK3ABO (03) 337 4902
 ● **KENWOOD TS-520S** fully optioned FM-board CW, AM, SSB filters, PS-50 power supply, AT-250 automatic ATU, SP-430 extension speaker, hand-mic, complete with manuals and boxes in perfect condition, \$1975. Paul VK3DA (059) 83 1771 or (03) 789 1237
 ● **YAESU FT707 HF** 100 W mobile transceiver, good condition, complete, \$650. George VK3ZF (03) 435 1697.
 ● **YAESU FT101E** txcvr plus spare valves s/n 6J201420 \$400. Lindsay VK3ANJ QTHR (051) 55 1380.
 ● **KENWOOD TS850S/SAT** current model HF base txcvr with auto ATU and DRU-2 digital recording unit, voice module s/n 20800698 \$3000, SP31 speaker to suit \$100. All mint cond. Chris VKGBRT QTHR (057) 84 3215.
 ● **SYSTRON Donner** model 1327B radio comms analyser, 1 MHz to 950 MHz, 100 Hz resolution, FM/CW, RF op 0.1 μ V to 10 mV, off air receiver 1 mV sensitivity, measure deviation to 20 kHz, cw oscilloscope 20 kHz resolution, frequency error meter \$2100. Lee VK3GK (03) 544 7368.
 ● **KINGSLER** AR-7 coil boxes A,B,C,D,E and spares B,C,D, offer: TECHTRONICS model 535 dual beam oscilloscope, gc, partly restored cw 2 plug-in units "CA", "B" and all h/books, offers over \$350. R Hill VK3RC QTHR (057) 99 1388.

● **YAESU FT-707** txcvr c/w service manual, \$600, YAESU FRG-7 comms rx, \$200 Craig VK3DSG (03) 887 3875
 ● **KU** brand LNC, \$25, SATELLITE TV receiver Model 1022A, \$110. Vincent VK3AJQ (03) 872 3503.
 ● **DTMF** Decoder board (Silicon Chip) May 91, control appliances v.a telephone, \$130 ONO: IBM XT 9088 mother boards, \$40 APPLE IIE 128 k RAM card, \$80, AWA VHF FM carphone, Tx OK, \$25, VHF receive valves, \$4 each, Tx tubes, \$12 each Vin VK3AJO (03) 872 3503.
 ● **SHACK CLEAROUT** Military radios, Ken KP202 2 m FM h/h txcvr (s/n PD13729), valve test equipment, cables, power supplies, transformers, magazines, h-fi, old computer parts, components old and new, 30 year accumulation of maybe-useful stuff. Make an offer and help me move house: it's a nightmare! Kim VK3ZZH (03) 836 6908 AH.
 ● **ICOM IC-W2A** dual band h/held, expanded rcvr, crossband repeat, leather case, BP82, BP83, charger, ext mic, CP13 12 V lead, gc, \$890 BC72V desk top charger \$180. DIAMOND RH77 dual band ant, \$50 VK3KFC (059) 95 3580.
 ● **BRAND NEW** VALVES 8.5, \$25 QOE0640, \$15 QOE0312, \$5 QOE0215, \$5 QOE0415, \$5. Motorola lowband Maxcar conv to 6 m, 25 W, manual, \$80 ONO AWA RT80 10 ch lowband mobile with spares. \$80. A Bartel VK3ZOT (03) 700 3578.

FOR SALE QLD

● **VALVES** for restorers collectors, some unused in cartons, octals, novals, metals military, all tested, sockets, ceramics s/e/s all types. Send 9" x 4" SASE for new list. Reduced prices. Ted VK4YG PO Box 245, Ravenshoe Qld 4872, (070) 97 8387
 ● **KENWOOD TS520S**, (vgc, mic, handbook, \$450, YAESU FRG7700 receiver 0.5 to 30 MHz 12 memories, handbook, \$450. For the restorer Swan txcvr SW120, circuits, spare tubes \$25. Trevor VK4ATS (07) 265 4974
 ● **ICOM IC471H** 70cm al-mode, vgc \$1200; ICOM IC730 HF txcvr, vgc, \$750, UHF PA module DUGHO, \$250 Rod VK4KZR (07) 353 3379
 ● **5 ELEMENT** triband yagi CF35DX \$250 plus P & P Alan VK4AAR (076) 85 2417
 ● **KENWOOD TS820**, digital readout, VFO820, MC50 m c plus service and owners manuals, gc, \$540. Aubrey VK4AFO 8 Charies St, Malanda QLD 4855.
 ● **COLLINS TCS-12**, 1.5 to 12 MHz 1625w m modulator and finals. Converted from anode to cathode yoking. Elegant working example of wartime JAN (joint army/navy) transmitter and receiver comb nation, \$300, MILITARY whip antenna, 2 piece x 3 m long, \$30, MULTITESTER, Sanwa N-501 (top of range) 2 μ A FSD, 10 A AC/DC, etc. \$95 FUNCTION Generator, home brew gwc, \$30 John VK4SZ QTHR (070) 613 286.

FOR SALE \$A

- ICOM IC-271A 2 m all mode, \$850 ono; ICOM IC471A 70 cm all mode, \$850 ono
- KENWOOD TS450SAT HF all mode, \$1600 ono; KENWOOD TS520S, AT200, SP520, \$500 ono; KENWOOD SM220 station monitor, \$350. Barry VK5KCX QTHR (065) 22 4526.
- Amateur Radio Action magazines, Vol 1 (1978) to Vol 10 (1986), best offers; also various editions of other electronics magazines. Bruce VK5KJ (081)255 3566 after 1900 CST.

FOR SALE WA

- ICOM IC490A all mode 70 cm transceiver with backup memory power supply and manual, excellent condition, \$650. Ron VK6GR QTHR (097) 52 2651.
- ICOM IC735 HF 100 W, top condition, \$1300, s/n 17303; EMTRON tuner 300A with dummy load, \$250; CODAN wire tuner, \$100; ICOM RC10 remote controller, \$90; ICOM 720A band change switch, \$80. Graham VK6RO (09) 451 3561.
- TH3 Tri-band beam, 80 ft wind up tower 3 sections with rotator and coaxial cable. Offered wanted to dismantle and remove. Ian VK6XX QTHR (09) 458 3898.

FOR SALE TAX

- ICOM IC-25A 25 W 2 metre mobile transceiver, s/n 03074, with mike and manual in good condition, \$250. Jim VK7JO QTHR (003) 44 3314.
- AOR 3030 comm rcvr, new, 150 kHz — 30 MHz, commercial quality built in collins mech filter, AC, DC, int batteries, ECSS Fax SSB AM FM, must sell, brand new, paid \$1599, what offers? Allen Burke VK7AN (003) 27 1171.

WANTED NSW

- **FLARE** and driver for Amplion horn speaker. Dragonfly and Dragon junior models. Receiver section type A MK3 spy radio complete or any parts particularly coils and IFTs. Morse keys any type. Swap or cash. Ric VK2AZQ QTHR (02) 817 0337.
- **ARGONAUT 509** and Microbee software. Rav VK2FW QTHR (063) 65 3410.

WANTED VIC

- MARCONI TR1154 transmitter, preferably working order or capable of restoration, for soon-to-be-announced Australian National Museum of Aeronautics and Space at Point Cook, VIC. Please contact Allan Dobbs VK3AMD (03) 570 4610 or Author Evans VK3VQ (03) 587 5600.
- POWER transformer to suit AR88D, partly stripped chassis with power-transformer acceptable; also required AR88D steel case; Satellite dish, 2.2 meters diameter for C band operation. W Babb VK3AQB (03) 337 4902.
- FT200 power supply for restoration project. C Jarvis VK3CYD QTHR (051) 27 4248 AH.
- Manuals original or photocopy of ATU leader LAC895; SWR/Watt Leader LPM885; Sig gen B & K 2050; Oscilloscope BWD 539; Sig gen MI TF2015, also VK3BEL QTHR.
- HF linear amplifier FL2100 or similar in good condition. Ken VK3NJ QTHR (03) 561 4214.
- MARCONI 2955, 2960/57 radio test set with amps or MPT1327. Lee VK3GK QTHR (03) 544 7368.
- COMM RCVR RCA AR88, any parts, any condn, also power transformer; any Morse keys, telegraphic equipment, etc. Maurice VK3CWB QTHR (050) 22 2120.

● **ASSISTANCE** with research into Leopold Gilbert Cohen (late) maker and founder of the Simplex auto "Jigger" or semi auto Morse key. Next of kin or oral history sought. Maurie VK3CWB QTHR (050) 22 2120.

WANTED QLD

- AR88 receiver urgently required, also give a museum home to old Heathkit amateur equipment, basket cases or not. "Doc" VK4CMY, Granite Belt Amateur Wireless Group, Dalveen (076) 61 6204 BH or (076) 85 2167 AH.
- ICOM SM-8 desk mic; Auto-transformer, variable, 0-260 V 10 A, John VK4SZ QTHR (070) 613 286.

WANTED SA

- AUTO manipulator MK701 keyer single paddle, new or second hand, reas price. Bert VK5AUS QTHR (08) 344 5011.
- OWNERS manual and workshop manual for Akai solid state X 150D reel to reel tape deck. Prefer to borrow to photocopy (unless someone has a spare). All expenses (phone calls, postage, etc) reimbursed. Bruce VK5KJ (08) 255 3568 after 1900 CST.

WANTED WA

- FTDX560 transceiver in good working condition with manual, any spare valves an advantage. All offers considered. Terry VK6ATM (096) 82 5061

MISCELLANEOUS

- **THE WIA QSL Collection** requires QSLs. All types welcome, especially rare DX pictorial cards special issue. Please contact Hon Curator Ken Matchett VK3TL, 4 Sunrise Hill Road, Montrose Vic 3765. Tel (03) 728 5350.

Hamads

Please Note: If you are advertising items For Sale and Wanted please use a separate form for each. Include all details; eg Name, Address, Telephone Number (and STD code), on both forms. Please print copy for your Harrod as clearly as possible.

*Eight lines per issue free to all WIA members, ninth line for name and address. Commercial rates apply for non-members. Please enclose a mailing label from this magazine with your name.

*Deceased Estates: The full Name will appear in AR, even if the ad is not fully radio equipment.

*Copy typed or in block letters to PO Box 2175,
Caulfield Junction, Vic 3161, by the deadline as indicated on page 1 of each issue.

*QTHR means address is correct as set out in the WSA current Call Book.

*WIA policy recommends that Kernads include the serial number of all equipment offered for sale.

*Please enclose a self addressed stamped envelope if an acknowledgement is required that the Hamad has been received.

Ordinary Hamads submitted from members who are deemed to be in general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re-sold for mercantile purposes.

Conditions for commercial advertising are as follows: \$25.00 for four lines, plus \$2.25 per line (or part thereof) Minimum charge — \$25.00 pre-payable.

Figure 1. The study area and the location of the sampling stations.

[illegible]

Not for publication:

☐ Miscellaneous

 For Sale

☐ Wanted

Name: _____ Call Sign: _____ Address: _____

TRADE PRACTICES ACT

It is impossible for us to ensure the advertisements submitted for publication comply with the Trade Practices Act 1974. Therefore advertisers and advertising agents will appreciate the absolute need for themselves to ensure that, the provisions of the Act are complied with **strictly**.

VICTORIAN CONSUMER AFFAIRS ACT

All advertisers are advised that advertisements containing only a PO Box number as the address cannot be accepted without the addition of the business address of the box-holder or seller of the goods.

TYPESETTING AND PRINTING:

Industrial Printing and Publicity Co Ltd, 122 Dover Street, Richmond, 3121.

Telephone: 428 2958

MAIL DISTRIBUTION:

R L Polk & Co Pty Ltd, 96 Herbert St, Northcote, Vic. 3070. Tel: (03) 482 2255

CONTRIBUTIONS TO AMATEUR RADIO

Amateur Radio is a forum for WIA members' amateur radio technical experiments, experiences, opinions and news. Manuscripts with drawings and/or photos are always welcome and will be considered for possible publication. Articles on computer disk are especially welcome. The WIA cannot assume responsibility for loss or damage to any material. "How to Write for Amateur Radio" was published in the August 1992 issue of AR. A photocopy is available on receipt of a stamped, self addressed envelope.

BACK ISSUES

Available only until stocks are exhausted. \$4.00 to members, which includes postage within Australia.

PHOTOSTAT COPIES

When back issues are no longer available, photocopies of articles are available to members at \$2.50 each (plus \$2.00 for each additional issue in which the article appears).

The opinions expressed in this publication do not necessarily reflect the official view of the WIA, and the WIA cannot be held responsible for incorrect information published.

ADVERTISERS INDEX

Amateur Radio Action	12
ATN Antennas	15
Coman Antennas	26
Daycom	9
Dick Smith Electronics	27, 28, 29
Emtronics	20
ICOM	OBC, 23
Kenwood Electronics	IFC
Strictly Ham	17
Terlin Aerials	11
WIA Divisional Bookshops	IBC

Trade Hamads

M Delahunty	54
RJ & US Imports	54

HOW TO JOIN THE WIA

Fill out the following form and send to:

The Membership Secretary
Wireless Institute of Australia
PO Box 2175
Caulfield Junction, Vic 3161

I wish to obtain further information
about the WIA.

Mr, Mrs, Miss, Ms:.....

Call Sign (if applicable):.....

Address:.....

State and Postcode:.....

WIA Morse Practice Transmissions

VK2BWI Nightly at 2000 local on 3550 kHz

VK2RCW Continuous on 3699 kHz and 144.950 MHz 5 wpm, 8 wpm, 12 wpm

VK3COD Nightly (weekdays) at 1030 UTC on 28.340 MHz and 147.425 MHz

VK3RCW Continuous on 144.975 MHz 5 wpm, 10 wpm

VK4WIT Monday at 0930 UTC on 3535 kHz

VK4WSS Tuesday at 0930 UTC on 3535 kHz

VK4WCH Wednesday at 1000 UTC on 3535 kHz

VK4AV Thursday at 0930 UTC on 3535 kHz

VK4WIS Sunday at 0930 UTC on 3535 kHz

VK5AWI Nightly at 2030 local on 3550 kHz

VK5RCW Continuous on 144.975 MHz, 5 wpm to 12 wpm

VK6WIA Nightly at 1930 local on 146.700 MHz and nightly (except Saturday)
at 1200 UTC on 3.555 MHz.

WIA Divisional Bookshops

The following items are available from your Division's Bookshop
(see the WIA Division Directory on page 3 for the address of your Division)

	Ref	List Price		Ref	List Price
ANTENNAS			OPERATING		
Ant. Compendium Vol 2 Software 5.25" IBM Disk	0F023	\$22.00	Analogue Radio Awards Book - RSGB	0R029	\$30.00
Ant. Compendium Vol 3 Jan Ed. 1992	0F045	\$37.50	Antenna Techniques - G3VLA - RSGB	0R028	\$35.00
Antenna Compendium Vol 2 - ARRL	0R022	\$32.00	DXCC Companion - New to Work Your First 100	0R045	\$16.00
Antenna Impedance Matching - ARRL	0R027	\$62.00	DXCC Country Listing - ARRL	0R049	\$5.00
Antenna Hole Book W1FBP - ARRL	0R179	\$28.00	FCC Rule Book - A Guide to the FCC Regulations	0R079	\$25.00
Antenna Pattern Worksheets Pkt of 10	0R002	\$3.00	Locator Map of Europe - RSGB	0R085	\$5.00
Custom Cut Antennas - Harland - 1993	0R041	\$37.50	Log Book - ARRL - 9" x 11" Wire Bound	0R022	\$6.00
Easy Use Antennas	0F020	\$36.25	Low Band Wiring - John Devlin	0R185	\$22.00
G-Club Antenna Handbook - RSGB - 1992 1st Edition	0F042	\$22.50	Operating Manual - ARRL - 4th Edition	0R192	\$48.00
HF Antennas Collection - RSGB	0F038	\$44.00	Operating Manual - RSGB	0R039	\$31.00
HF Antennas for all Locations - Moon - 2nd Edition	0F18A	\$45.00	Pocket to World Band Radio	0R048	\$45.00
HF Antennas for all Locations - RSGB - 1993	0F088	\$45.00	Profile Map of the World - RSGB (unbound)	0R057	\$25.00
Novice Antenna Compendium Vol 1 - ARRL	0F183	\$26.00	RTTY/AMTOR Companion ARRL 1st Ed 1993	0R045	\$21.00
Novice Antenna Handbook - Dekker W1FBP - ARRL	0F182	\$20.00	The Complete DXer - W9RNI	0R194	\$35.00
Physical Design of Yagi - 3.5" IBM Disk	0F036	\$20.00	Transmitter Hunting	0R022	\$43.00
Physical Design of Yagi - 3.5" Mac Disk Excel Format	0F038C	\$20.00	World Grid Locator Atlas - (Maidenhead Locator) - ARRL	0R197	\$11.00
Physical Design of Yagi Antennas - The Book	0F038	\$26.00			
Practical Wire Antennas - RSGB	0F026	\$32.00	PACKET RADIO		
Reflections Transmission Lines and Antennas - 5.25" IBM	0F044A	\$22.00	AX.25 Link Layer Protocol - ARRL	0R178	\$21.00
Reflections Transmission Lines and Antennas - ARRL	0F044	\$22.00	Connections in Packet and Packet - ARRL	0R193	\$21.00
The Antenna Handbook - ARRL 1991 edition	0F079	\$62.00	Packet Computer Networking Conference 1-4 1993/9	0R188	\$38.00
Transmission Line Transformers - ARRL	0F039	\$52.00	Packet Computer Networking Conference No 10 1991 - ARRL	0R178	\$20.00
Vertical Antenna Handbook - Lee - 1990	0F084	\$22.00	Packet Computer Networking Conference No 1 1985 - ARRL	0R167	\$20.00
Wire Antenna Design - ARRL	0R184	\$40.00	Packet Computer Networking Conference No 6 1987 - ARRL	0R169	\$20.00
			Packet Computer Networking Conference No 1 1988 - ARRL	0R184	\$22.00
			Packet Computer Networking Conference No 1 1989 - ARRL	0R029	\$20.00
			Packet Computer Networking Conference No 2 1990 - ARRL	0R030	\$20.00
			Packet Radio Companion ARRL 1993 1st Edition	0R083	\$22.00
			Packet Radio Computer Conference 1982 - ARRL	0R071	\$22.00
			Packet Radio Primer - 06UZY - RSGB	0R040	\$28.00
CALL BOOKS			SATELLITE		
Radio Call Book International 1994	0R039	\$65.56	Satellite AMSAT 5th Space Symposium - ARRL	0R182	\$17.50
Radio Call Book North America 1994	0R038	\$66.56	Satellite AMSAT 8th Space Symposium - ARRL	0R189	\$17.50
RSGB Call Book 1993/94	0R045	\$38.00	Satellite AMSAT 8th Space Symposium - ARRL	0R149	\$25.00
			Satellite Antology - 1992 Edition - ARRL	0R180	\$21.00
			Satellite Experimenters Handbook	0R177	\$32.00
			Space Amateur - ARRL	0R099	\$30.00
			Weather Satellite Handbook - ARRL	0R024	\$62.00
			Weather Satellite Handbook Software 5.25" IBM Disk	0R026	\$22.00
FICTION			VHF/UHF/MICROWAVE		
CO Great Ship - ARRL	0R024	\$13.00	Microwave Conference 1993	0R049	\$30.00
Death Valley QTH - ARRL	0R026	\$13.00	Microwave Handbook Vol 1 - RSGB	0R018	\$38.00
Dez Bridge Canger - ARRL	0R028	\$13.50	Microwave Handbook Vol 2 - RSGB	0R037	\$57.00
Grand Canyon QSO - ARRL	0R027	\$13.50	Microwave Handbook Vol 3 - RSGB	0R047	\$57.00
Murder By QRM - ARRL	0R029	\$13.50	Microwave Update Conference 1987 - ARRL	0R174	\$18.50
SCS At Midnight - ARRL	0R028	\$13.50	Microwave Update Conference 1988 - ARRL	0R183	\$17.50
			Microwave Update Conference 1989 - ARRL	0R021	\$24.00
			Microwave Update Conference 1991 - ARRL	0R048	\$24.00
			Mid Atlantic VHF Con. October 1987 - ARRL	0R175	\$18.50
			Spectrum Source Book - ARRL	0R065	\$32.00
			UHF/Microwave Experimenters Manual - ARRL	0R026	\$33.00
			UHF/Microwave Experimenters Software - ARRL	0R027	\$22.00
			VHF 22nd Central States Con. 1987 - ARRL	0R172	\$18.50
			VHF 23rd Central States Con. 1989 - ARRL	0R096	\$17.50
			VHF 24th Central States Con. 1990 - ARRL	0R022	\$26.00
			VHF 25th Central States Conference 1991 - ARRL	0R046	\$26.00
			VHF 26th Central States Conference 1992 - ARRL	0R048	\$26.00
			VHF 27th Central States Conference - ARRL	0R070	\$32.00
			VHF Western Coast Conference 1992	0R041	\$21.00
			VHF/UHF 18th Eastern Conference - ARRL	0R044	\$37.00
			VHF/UHF/HP - ARRL - 1st Edition - 1992	0R067	\$40.00
			VHF/UHF/HP Eastern Conference - ARRL	0R045	\$37.00
			VHF/UHF/HP - ARRL - 1st Edition - 1992	0R067	\$40.00
MISCELLANEOUS			WIA MEMBERS' SERVICES		
Amateur Radio for Beginners - RSGB	0R002	\$13.50	Log Book Covers		\$18.00
Antenna Hole Book W1FBP - ARRL	0R057	\$28.40	WIA Badge - Diamond		\$4.00
Ferris Centennial Frequency Listing	0R087	\$40.00	WIA Badge - Diamond With Call Sign Space		\$4.00
Field Notes in Radio - Doug Dekker W1FBP	0R088	\$14.00	WIA Badge - Traditional Solid		\$4.00
G-Club Circuit Handbook - G Dobos - RSGB	0F041	\$21.00	WIA Badge - Traditional Red		\$4.00
Ham Radio Communications Circuit Files	0F027	\$24.85	WIA Car Bumper Stickers		\$0.50
Help For New Ham Radio - ARRL	0R028	\$26.00	WIA Car Window Stickers		\$0.50
Morse and Kinks 12th edition - ARRL	0F183	\$24.00	WIA Tape - Sounds of Amateur Radio		\$7.00
I Love Amateur Radio Car Bumper Sticker - RSGB	0F048	\$2.75			
I'm on the Air Car Bumper Sticker - RSGB	0F047	\$2.75			
National Educational Workshop 1991 - ARRL	0F024	\$14.00			
Novice Notes. The Book - QST - ARRL	0F029	\$16.00			
QRP Classics - ARRL - QST	0R023	\$32.00			
QRP Home Book - Dekker - ARRL	0R070	\$16.00			
QRP Operating Companion - ARRL - 1992 1st Ed	0R070	\$16.00			
QRP Operating Manual - ARRL - 1992	0R070	\$16.00			
Race Antennas - ARRL	0R077	\$40.00			
Solid State Source Book - ARRL - Volume 1	0R171	\$32.00			
Solid State Source Book - Dekker - ARRL					
MORSE CODE			WIA PUBLICATIONS		
Morse Code - The Essential Language	0R023	\$16.00	Australian Radio Amateur Call Book - 1994	0R150	\$12.50
Morse Code for Radio Amateurs - RSGB	0R051	\$16.00	Band Plans Booklet		\$2.50
Morse Code Tapes Set 1: 5-10 WPM - ARRL	0R031	\$19.50	WIA Log Book - Horizontal or Vertical Format		\$5.00
Morse Code Tapes Set 2: 10-15 WPM - ARRL	0R032	\$19.50	WIA Novice Study Guide		\$1.50
Morse Code Tapes Set 3: 15-20 WPM - ARRL	0R033	\$19.50			
Morse Code Tapes Set 4: 20-25 WPM - ARRL	0R034	\$19.50			
Morse Tutor 3.5" IBM Disk	0R187A	\$25.00			
Morse Tutor 5.25" IBM Disk	0R187	\$25.00			

Not all of the above items are available from all Divisions (and none is available from the Federal Office).

If the items are carried by your Divisional Bookshop, but are not in stock, your order will be taken and filled as soon as possible.

Divisions may offer discounts to WIA members - check before ordering. Postage and packing, if applicable, is extra.

All orders must be accompanied by a remittance.

The prices are correct as at the date of publication but, due to circumstances beyond the control of the WIA, may change without notice.



You can always teach an old dog new tricks.

Icom innovation continues! We're keeping pace with all the latest trends in communication. Even a crafty old dog like Icom's Duncan Baxter, VK 3LZ, is impressed. Three of our new radios—the IC-281H(2m), IC-481H(70cm) and IC-820H (dual band), have facilities for packet operation at 9600bps plus each model is loaded with today's other wanted features.

And the IC-820H is especially designed for satellite operation.

Call Duncan and the Icom team for a brochure or the name of your nearest dealer.

Icom Australia 7 Duke Street Windsor Victoria 3181

Free Call : (008) 338 915 Ph : (03) 529 7582 Fax : (03) 529 8485 A.C.N. 006 092 575



IC-281H



IC-820H